The Journal of
NERVOUS and MENTAL DISEASE

VOL. 126, NO. 5
MAY, 1958
SERIAL NO. 909

THE ROLE OF GENETICS IN PSYCHIATRY[1]

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With the increasing biological sophistication of the modern psychiatric research worker, and many technical advances in the various scientific disciplines converging on the problems of mental health and disease, recent trends in psychiatry have helped to break down time–worn prejudices and compartmentalizations. In this hopeful atmosphere, it might be appropriate to take a fresh look at the science of genetics, which has meanwhile undergone methodological and theoretical revitalization by its own impetus, and reevaluate the role and significance of this biological discipline in psychiatry today.

The primary purpose of this report is not to review the impressive body of current psychogenetic literature, as such accounts are available elsewhere (27, 31). Instead, we should like to reformulate the essential contributions which have been made by genetics to an integrated conception of psychiatric medicine. In such a scheme, marked by a number of distinct but related areas of investigation, genetics will be found, in theory as well as practice, to have performed an essential function at every level. Very much in the forefront of current psychiatric research, the basic character of the genetic approach can best be illustrated by projecting into the future some of today's advanced trends.

Modern biologists and philosophers of science have furnished the concept of levels of organization in which nature can be studied from the smallest particles to the largest aggregates of social animals (17, 44, 52). Accordingly, attempts have been made to define the various clinical and research approaches to the study of normal and disordered behavior in terms of the overlapping levels of organization on which the principal attention is focused (57).

While infracellular and unicellular levels are left to the physicist, chemist and cytologist, the organic approach to psychiatry would deal with chromosomal units, tissues, multicellular organs and organ systems; the psychological approach with organ systems and the responses of total organisms; the psychodynamic with the development of organisms in small societal units (families); and the psychosocial with the behavior patterns of larger social groups. The broadest concern with the ecological setting of man would be turned over to the naturalist, the meteorologist, and, surely in this age, the astronomer.

Without questioning the philosophical validity of these conceptualized levels of organization, it would be unduly restrictive

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to apportion the field of medico-psychiatric research among investigators who tend to use different approaches, according to the level of organization of the subject matter studied. Each investigator is forced by the very nature of his procedure to concern himself with the effects of natural phenomena, however organized, including those under discussion: the highly specific actions attributed to genes.

Indeed, the approaches themselves, although indicative of roughly different preferential interests in the behavioral sciences, are neither completely self-sufficient nor clearly separable. Only from a pragmatic standpoint can they be divided into the demographic and social, or the psychodynamic and psychological, or the organic and biological. In other words, they represent individual frames of reference with more or less different investigative techniques. As such, each in turn will be dealt with here as an exercise in the application of genetic knowledge to the mental sciences.

DEMOGRAPHIC FRAME OF REFERENCE

Considering first the macrocosm, one is delighted to see the wide attention given to the social and demographic (epidemiological) problems of psychiatry today. With such studies being directed toward relating the frequency, distribution and patterning of mental disorders in a given population to its life conditions, their main objective is to determine the differentiating effect of various outside factors on the cause or clinical symptomatology of properly defined disease entities (51).

Outside influences, however, react upon individuals who are also members of a population. It is in the study of these groups of people that the descriptive science of demography and the biological discipline of human genetics meet, since both are concerned with the dynamics and variable stratifications of human populations. The changing composition of these groups and their various modes of interaction with physical and social surroundings depend to a great extent on determining genetic principles.

No well-planned population study can disregard such forces as inmarriage and assortative mating patterns, formation and breakup of genetic isolates, migration, genetic drift, and the effects of mutation and selection without taking the risk of forming misleading opinions as to basic causes (32). Only with the genetic basis firmly established, can one assess the influence of social factors, themselves, of course, the product of evolutionary patterns. Whether a population consists of all the inhabitants of an island, a province or a neighborhood, or of persons sharing a severe form of deprivation, such as the deaf, a demographic investigation of mental illness may cast light on the determinants of such illness and the intricate interaction of genetic and nongenetic components, but only if it utilizes advanced techniques in both genetics and demography.

Moreover, while the primary objective of demographic research is to furnish an inventory of quantitative and qualitative population changes, the aim of genetic studies is to search for fundamental causes. The changing composition of populations and their various modes of interaction with physical and social surroundings are determined by basic factors which follow definite laws. Some of these underlying principles are elementary, others highly complex. With the science of human genetics less than sixty years old, and its offshoot of population genetics barely twoscore, a wealth of data has nevertheless been produced for man's study of himself and his origins.

In the development of the modern theory of genetics, which is now so essential in a biological approach to human populations, two periods have been distinguished by Goldschmidt (13), the statistical and the physiological. The statistical era began in 1865 with Gregor Mendel's report on

his garden pea experiments (38). His observations of the "unblended" separation and subsequent recombination of stable genetic units, confirmed in 1900, led to the first description of populations in mathematical terms—frequency and distribution of types on a genetic basis.

Proceeding from the premise that single characters behaved as if determined by paired particles in the germ plasm (later called genes or alleles), a study of the results of various types of mating confirmed the expected statistical ratios for both the phenotypes and genotypes of the offspring. The results differed according to the dominance or recessiveness of the gene in question.

In Goldschmidt's opinion, the statistical viewpoint in human genetics has been too static and "hyperatomistic." Its main weakness was seen in its tendency to lead to impossible consequences by requiring the postulation of more and more modifier genes to explain basic features of genetic adaptation.

In the physiological or dynamic genetic approach, discovery of the chromosomes (61) and subsequent identification of many of their chemical functions within the cell nucleus (43) gradually led to a broader conception of genetic phenomena. While the basically statistical tenets of genetics were fully accepted, the emphasis was placed on an understanding of variations in physical and mental health in terms of genic action and developmental systems, with all their consequences of interaction, embryonic regulation, and integration, rather than in "... looking for explanations in terms of unproved, additional systems of units for more and more genic permutations." In this scheme, genes came to be considered as clearly differentiated regions (loci) that preserve their identity, produce specific effects, and are capable of duplicating themselves.

On this basis, the field of action of modern genetics may be extended beyond its classical boundaries. The major goals of human genetics have traditionally been the following:

1. To predict the potentialities of the offspring in any given marriage.

2. To predict future population trends on the basis of more or less detailed information about the present composition of a population and the matings contracted within it.

3. To explore the phenomena of variation, species formation and evolution, as well as the specific mechanisms whereby those genes producing pathological changes are brought into play and may be accessible to therapeutic influence.

The new dynamic concepts make it reasonable to expect that genetic theory will include within its scope the balanced interactions of normal human functions so closely related to phenomena of health within a social group. Although "mutants which affect general features like growth, fertility, sterility and viability cannot be isolated and localized like the standard mutants of elementary Mendelism" (14), a sufficiently broadened theory should make it possible for the discipline of genetics to make its contribution not only to the analysis of rare pathological traits, but to all aspects of human existence.

Meanwhile, it is essential for any study proposing to ascertain the prevalence in a population of a well-defined trait and its possible genetic determinants to be aware of the basic mathematical principles of population genetics. It can be shown, as a direct consequence of the simplest Mendelian laws, that the genetic structure of any population, its compositions in terms of the various genotypes, would remain constant from generation to generation under the following conditions: (a) sufficiently large size; (b) random mating, every male having the same chance to mate with any female; (c) no selective advantage of one allele over the others at any locus; and (d) absence of mutations. This principle, the

cornerstone of a methodological approach to population genetics, is known as the Hardy-Weinberg law (15, 63), and makes it possible to study the major causes of modifications in the ideal generation-to-generation equilibrium. These influences are limited to assortative mating, the effects of small populations, and the phenomena of mutation and selection.

Adequate consideration of demographic principles of this kind in "epidemiological" studies will avoid pitfalls stemming from neglect of such important potential influences as patterns of mating based on consanguinity or similarity, migration, and the processes of natural and artificial selection. The given factors may exert a decisive effect upon the frequency of gene-specific variations.

Exact statistical methods are necessary, of course, to evaluate the actual frequencies of such variations, both in the general population and among the relatives of affected individuals. Careful comparisons of these values, as modified from one group to another, provide the lead as well as the impetus to meaningful etiological studies.

The methods used in genetic studies differ according to whether an analysis deals with the health problems of certain groups of families or of entire populations. Mendelian ratios express no more than the average expectancy of a gene-controlled trait in a representative population sample. Various statistical procedures are needed to determine the validity of inferences drawn from individual observations (56).

Since statistically representative samples of subgroups of people or entire populations are so essential, genetic data obtained from individual families (pedigrees) usually prove of limited value. The usefulness of the ordinary family history method is restricted to rare pathological conditions that are easily traced genealogically. For the purpose of a comprehensive genetic analysis, the applications of total population surveys (census method) are also limited. Exceptions are surveys concerned with small and sufficiently cooperative populations (isolates), as well as those dealing with relatively uncomplicated traits that can be ascertained by enumerative procedures.

The most useful methods for genetic analysis have been Weinberg's system (proband-sibship and abridged methods) and certain extensions of the twin-study method (twin family method). In Weinberg's system, the chief objective of a comparative analysis is to determine whether a particular trait occurs more frequently in blood relatives of a representative number of probands or index cases (persons disclosing clinical evidence of the trait in question), than in the general population or, more precisely, in a group of persons not ascertained through known consanguinity to the given type of proband. Inequalities in age distribution have to be corrected by the use of the abridged method (64) or such similar procedures as morbidity tables or Ilse's and Strömgren's methods (24).

In Weinberg's method, the actually observed (absolute) morbidity figures are related not to the total population but to the number of persons who have survived the given period of manifestation, increased by half the number of persons who at the time of the study are still within the age limits of this period. Persons who did not reach (because of death), or are too young to have reached, the beginning of the manifestation period are not counted as part of the base. This method yields morbidity rates which denote the average expectancy of developing the disease by persons who remain alive through its usual manifestation period. The range of this period is chosen in accordance with clinical experience.

Comparable corrective procedures are used in the twin-family method, which combines the principles of the proband-sibship and abridged methods with those of the twin-study method, the most effective

procedure for exploring the genetics of human behavior, both normal and abnormal. Comparative data are obtained in six dissimilar sibship groups related to a set of representative twin index cases; one-egg twins, two-egg twins of the same sex, two-egg twins of opposite sex, full sibs, half-sibs, and step sibs. This procedure provides a unique opportunity of investigating intra-family variations with a minimum of uncontrolled variables, especially with respect to traits that present complex sampling problems and require comparisons in both cross-sectional and longitudinal directions.

PSYCHODYNAMIC FRAME OF REFERENCE

Turning from the role of genetics in demographic and special family studies to a second level of psychiatric interest, we enter an area that has long been identified with the psychotherapeutic aims of psychiatric work, namely, the province of psychodynamics. While highly individualized in its practical application, the science of psychodynamics has always been postulated by Rado and others (33, 49, 53) to be part of "a unitary conceptual scheme in human biology," in which behavioral variations are analyzed in the gene–specific physiological (biochemical, biophysical) context of the organism. In such a scheme, the psychodynamic approach—focussed on an understanding of motivation and emotional control—can uncover behavior problems which await their exact solution from physiology and genetics.

This conception extends a current of psychoanalytic thought which goes back to Freud and his contemporaries and is becoming increasingly fruitful today, especially in studies of the infant and child, and in psychosomatic research. The particular role of genetics in these studies is not always made explicit, and it would therefore be well to point out the marked advantages and potentialities which fall within the reach of workers who combine the methods of both disciplines.

Such an integrated approach may penetrate into the core of future psychodynamic work. In essence, it affords an opportunity to recognize fundamental genetic differences among individuals and correlate them with prenatal and postnatal developmental interaction. Early formulations of this approach are found in such writings of Freud as the following (9): "We divide the causes of neurotic disease into those which the individual himself brings with him into life, and those which life brings to him—that is to say, into constitutional and accidental."

Similar thoughts were expressed by Jones as follows (21, 22): "Ever since Mendel's work it has been evident that in estimating the relation of heredity to environment in respect to any character, we have first to ascertain the component units in that character; in other words, what actually constitutes an individual gene . . . By means of psychoanalysis one is enabled to dissect and isolate mental processes to an extent not previously possible, and this must evidently bring us nearer to the primary elements, to the mental genes in terms of which genetic investigations can alone be carried out; . . . the next study to be applied would be one in the field of heredity."

While these statements referred to the relative strength of instinctual fixations and erogenous zones, Freud foresaw current trends by characterizing primary ego differences as follows (10): "We have no reason to dispute the existence and importance of primary congenital variations in the ego. A single fact is decisive, namely, that every individual selects only *certain* of the possible defensive mechanisms and invariably employs those which he has selected."

In line with such observations, psychodynamic concepts also embody the premise that man is selective in respect to important aspects of his life experiences and so can be thought of as "creating his own environment" (1). It is therefore apparent that the complex problems of aberrant develop-

ment and behavior, as defined with increasing clarity by psychodynamic research, will be fully understood only if the genetic dimension is considered an integral part of the overall frame of reference.

In the field of infant and child psychiatry, Levy (36) was one of the first who called attention to intrinsic differences among children as equipotent with maternal attitudes in determining final behavior patterns. Efforts in the same direction were made by Escalona and her coworkers (5) in relation to sleep, feeding and sensory responses; by Fries and Woolf (11) as to activity types; by Mittelmann (41) as to motor behavior; and by Thomas and Chess (59) as to specific reaction patterns.

Genetic analysis will be the logical next step in studies of this kind. This step should not be delayed too long, as there is well-founded hope that collaboration between the disciplines of psychodynamics and psychogenetics will eventually provide complete insight into normal and extreme variations in human behavior. In such a collaborative scheme, longitudinal family studies and comparative twin research, conducted by means of techniques made available by depth psychology, are bound to produce refined psychodynamic and population data in all areas of psychopathology.

In the field of psychosomatic medicine, there is an equally urgent need for extending research to gene-specific variations, both in terms of populations and in relation to family units (twins). The causative role played by psychodynamic factors in the etiology of psychosomatic conditions may forever remain inconclusive without (a) comparative morbidity risk figures based on statistically representative and clinically homogeneous samples and (b) adequate information about underlying metabolic processes and their variations. In some instances, let us say, the observed psychosomatic deviations may well be related to changes in autonomic function.

For example, the blood pepsinogen level has been studied by Mirsky and his coworkers (40) as a measure of gastric activity and secretion. Their hypothesis is that functional differences among infants in this area may cause correspondingly different feeding responses, modify subsequent personality development, and eventually result in vulnerability to peptic ulcer. Measures of autonomic function by Lacey and his group (35) also showed many individual variations in systematic and idiosyncratic patterns of response.

Applying factor analysis to personality characteristics as measured by a wide variety of psychological techniques, Eysenck (6) observed that many differently formulated theories of neurosis are on the same descriptive level and concerned with the same fundamental dimension of personality. Together with Prell (7), he was one of the few investigators of psychoneurotic reaction potentials who availed himself of the opportunities afforded by the twin-study method. On the basis of data obtained from 25 one-egg and 25 two-egg pairs, this team classified the "neurotic personality factor" as a biological and largely gene-specific entity, estimating the genetic contribution to this "neurotic unit predisposition" at 80 per cent.

Other experimental approaches to the genetics of behavior are exemplified by the research of Scott and his group of workers (58) at the Jackson Memorial Laboratories, aimed at breeding behavior-specific strains of dogs; by Tryon's work (60) concerned with separating lines of rats that differ in their success at solving a maze; and by the provocative Drosophila studies of Hirsch (19). In the Drosophila experiments, attempts have been made not only to select genotypes displaying extreme forms of behavior in response to light and gravity, but also to correlate behavior variation with chromosome structure. At the present stage of genetic knowledge, ambitious schemes of this kind are possible only

with so well-studied an organism as is available in the fruitfly.

Stimulated by the concepts and methods of modern physiological genetics, these pilot studies point the way toward successful research in the psychodynamic and psychosomatic sectors of psychiatry.

BIOCHEMICAL AND NEUROPHYSIOLOGICAL FRAMES OF REFERENCE

With psychogenetic and psychodynamic phenomena bound inseparably, the third avenue of approach leads from either type of investigation to a joint sphere of interest, the organization and physiology of the central nervous system. As mental illness usually manifests itself in derangements referable to this intricate functional system, it inevitably becomes an important subject for brain research. With Alzheimer, Bonhoeffer, Charcot, Pavlov, Kraepelin, Sherrington and the early Freud in the avant-garde of modern electrobiochemical brain researchers, the much heralded "new look" in psychiatry is really not so new after all.

Hence, in turning from psychophysiological concerns to the broad sectors of neurophysiology and neurochemistry, we find a substantial body of investigative work that has been guided and inspired by genetic ideas. In the major psychoses, for instance, various data obtained by well-controlled twin family studies have provided the stimulus to organize the search for predisposing, precipitating (aggravating), perpetuating and protective elements in the course of these conditions. The list of psychopathological processes for which depressive types of psychosis (25, 30). Since these two disorders do not occur interchangeably in the same twin pairs, they are assumed to be genotypically specific.

In the cyclic group, the potentiality for developing a psychosis is probably associated with a subtle disturbance in a neurohormonal control mechanism, which ordinarily protects a person from having harmful extremes of emotional response. Concordance rates of two-egg and one-egg twins vary from 26.3 to 95.7 per cent, indicating that the tendency to exceed the normal range of mood vacillation would seem to require the mutative effect of a relatively dominant gene (with a trend toward incomplete penetrance).

By the same token, the metabolic deficiency in a potentially schizophrenic person has been assumed to be the result of a basically recessive unit factor, responsible for a specific vulnerability to stressful experiences. The varying clinical expressions of the ensuing disordered behavior pattern are probably produced by a number of modifying genes. Generally speaking, these variations depend on the type and degree of constitutional defense reactions that can be mobilized against the main biochemical (enzymatic) dysfunction.

As the observed concordance rates for two-egg and one-egg twins (based on a series of 953 pairs) differ from 14.5 to 86.2 per cent, it may be pertinent to mention that the diagnoses of the schizophrenic index cases as well as their cotwins were, in almost all instances, independently confirmed by the staffs of the mental hospital in which they were patients.

Concerning the morbidity risk for the offspring of matings between one schizophrenic and one nonschizophrenic parent, it is still correct to say that the expectancy of the disease approximates 16 per cent and depends largely on the biological qualities of the second parent. However, the question of how to designate a mode of transmission that seems distinguished by a specific unit factor for the entire syndrome, plus a number of modifying genes responsible for the variable clinical expressions of the main genotype, has become more or less a matter of semantics.

Whether the given main gene appears primarily dominant or recessive, or fails altogether to show simple segregation ratios, the modern concept of Mendelian heredity as recently reformulated by Allen (2),

implies equivalence with chromosomal heredity. At the present stage of knowledge, one no longer believes that the demonstration of a gene–specific mechanism "hinges upon the counting of simple Mendelian ratios." Hence the classifications of dominance and recessiveness are now regarded by some as no more than "operational definitions for counseling purposes."

Apparently, most pathological conditions in man are neither fully dominant nor completely recessive, but only relatively so, depending upon the readiness with which the trait is detectable in the heterozygote. It has even been suggested that all carriers of mutant genes would react abnormally if placed under sufficient biological stress.

Another point has just been reemphasized by Allen (2); namely, that any effect produced by a mutant gene comes within the scope of human heredity, whether it be an enzymatic disturbance or an inherent lack of ability to respond to certain environmental stimuli with a normal type of behavior. Actually, a disordered behavior pattern may in some instances stem even more directly from the postulated change in primary gene action than a correlated anatomical defect. If this theory is correct, the demonstration of anatomical or chemical correlates would no longer be an essential stipulation for inherited behavior patterns, since the latter characteristics may have a gene–borne evolution of their own. The work of Rado and his school (48, 50) in defining the basic clinical manifestations of the "schizotype" would conform with this principle. His description of schizophrenia in terms of an "integrative pleasure deficiency" coupled with a "proprioceptive disorder" is remarkably precise.

Although there is one important reservation, namely, that a possible organic correlate of mental disorder may be the consequence rather than the gene–specific cause of disturbed behavior, every possible effort is being made to find the basic metabolic deficiency in mental illness, particularly in schizophrenia. In this approach, it has been hypothesized that vulnerability to schizophrenia may be correlated with one or both of the following enzyme-controlled factors: (a) Qualitative changes in the metabolism of adrenaline, with more rapid oxidation or the production of abnormal oxidation products such as adrenochrome or adrenolutin; or (b) "quantitative changes causing shifts in the neurohormonal balance, involving excesses or deficits of acetylcholine, adrenaline, noradrenaline, serotonin, or serotoninlike substances" (18). The last-named hypotheses were derived from the observation of psychotic-like mental changes connected with either an increase in serotonin action due to the administration or production of analogues or a decrease due to the effect of antimetabolites.

Taraxein is one of the peculiar substances which have been isolated from the serum of schizophrenics (16). When injected into normal controls, this substance has been found to produce schizophrenia–like symptoms of limited duration. Along with various other observed dysfunctions in schizophrenia, however, this finding awaits confirmation by further research. Eventually, some of the reported observations in this field may prove to have been factitious, others to be linked by a common denominator.

At any rate, despite considerable progress in the neurochemical area of personality organization, it may be said at this time that the primary physiodynamic substrate of schizophrenia remains veiled in mystery. Even less is known about gene–specific metabolic deficiencies peculiar to disturbances in the involutional and senile periods, including those associated with such well–defined clinical entities as cerebral arteriosclerosis, paralysis agitans, and presenile brain atrophies of the Pick or Alzheimer variety.

In the fields of normal neurochemistry and neurophysiology, brain enzyme concentrations as related to behavior, as well

as variations in conditioning and electroencephalographic patterns, have been successfully studied in accord with the genetic approach. For instance, Krech et al. (34) demonstrated a correlation between acetylcholine concentration in the brain and the variable propensity of the rat to use maze-solving techniques. Such inborn differences in conditioning patterns were originally noted by Pavlov (47). Applying his concepts to the study of human personality, Franks (8) found conditionability to be related to the introversion-extraversion score on Eysenck's scale.

Closely allied to the work centered on the central nervous system proper has been the research dealing with the biochemistry (metabolism) of the body, including endocrine function. According to Reiss (54), among others, there is a genetically controlled variability which extends its range to predisposing factors for mental illness.

Encouraged by such pioneer studies, psychiatric research centers are now searching for definitive physiological and chemical correlates of gene-specific behavior patterns. With so much evidence pointing to multifactor causation in most psychiatric disorders, it would seem that the time is at hand for attempting to conquer such illnesses with well-planned attacks at the biological level.

MOLECULAR FRAME OF REFERENCE

At the microcosmic end of the scale of psychiatric research activity, there are the intriguing mysteries of molecular (cellular) function. Here attention is directed neither to organized neural patterns nor to endocrine or other chemical mediators, but to specific types of malfunction in the smallest biological units. This approach is epitomized by Gerard's aphorism that there is no twisted thought without a twisted molecule (12).

In line with such ideas, some of the suspected metabolic deficiencies in schizophrenia have been hypothetically related to the immunological or detoxifying (45) functions of the reticulo-endothelial system. The observed positive correlation between lack of resistance to schizophrenia and that to tuberculosis may be connected with deficient patterns of antibody formation (25).

In turn, these phenomena lead to an early hypothesis, still not adequately studied, that schizophrenia represents a genetically determined dysfunction of cellular elements derived from the reticulo-endothelial system (39). Studies of enzymatic activity within and on the surface of red cells (3, 23) also point to a widespread defect of cell units as a basic mechanism.

Hypotheses of this kind seem to come closest to the postulated level at which genes exert their primary action. Any formulation of the "one gene, one enzyme" axiom (20) calls for investigating the mechanism of action of hereditary elements in the area of primary biochemical reactions. Recent genetic findings on the relation of the genic material of cell nuclei to cytoplasmic metabolism (62) indicate the scene in which to search for the earliest link in the chain. In all such approaches, and indeed in every biological study in humans, twin family investigations will continue to offer the most adequate control material (28).

In the realm of this basic biologic stratum, molecular research, the province of the physical chemist (46), merges with that of the experimental geneticist working at the chemical, genic, chromosomal, cellular or developmental level. Outside of this range, our scheme would carry us into atomic physics, and today even this originally far-removed discipline is not unrelated to human genetics (55).

The phenomenon of mutation holds one of the key positions in the crucial area of genetic changes. Transmitted to the next generation via the germ cells, such changes in the germ plasm may occur either spontaneously and with predictable frequency,

or reactively in response to various agents. Prominent among them is ionizing radiation (42).

In view of the palpable danger of an increasing "load of mutations" due to the relaxation of natural selection by medical advances, genetic radiation hazards have become a matter of serious concern to everyone in recent years, including psychiatrists and neurologists and any other profession requiring extensive medical use of X-rays. Committees organized to study this problem have recommended general public health measures designed to limit medical irradiation to safe lifetime amounts and to the lowest doses consistent with medical necessity. They have also stressed the need for much more systematic research "about all kinds and all levels of genetics" (4, 37).

AREAS OF PRACTICAL APPLICATION

Apart from its indispensability in all branches of psychiatric research, an understanding of physiological and population genetics is a prerequisite for the psychiatrist in caring intelligently for his patients and their families (26). As "the tendency to deemphasize genetic factors as potential causes of behavior disorders is an occupational hazard of our profession and older than psychiatry itself as a social phenomenon" (29), reluctance to recognize the operation of genic elements in the etiology of mental disturbances is liable to create blind spots in evaluating the personal and family problems of any psychiatric patient, hospitalized or ambulatory. Biased attitudes are sure to lead to harmful omissions in treatment as well as in family guidance. In addition, there are the hazards of a gradual increase in the number of poorly adapted carriers with a chance of reproduction, such as may result from assortative mating trends and excessive use of ionizing radiation.

Family and population problems as encountered in psychiatry have their roots in the biological sciences, among which genetics is now a respectable member. This truism should lead to productive cooperation between psychiatrist and geneticist, each trained to understand the methods and principles of the other. On such a basis, psychiatry will grow as a science and continue to thrive as a profession.

SUMMARY

1. As a basic biological science, genetics is not limited in its influence to any particular level of psychiatric research. It can be of value to all psychiatrists, whatever their primary interest and approach.

2. Demographic (epidemiological) studies promise to be most productive if they take into account the principles and refined methods of population genetics. Modern theories of genic action open variations in normal and disordered behavior patterns to genetic investigation.

3. To be considered as part of human biology, psychodynamics will have to heed genetic theories within its framework when planning its search for new concepts and explanations. Implicit in classical psychoanalytic theory, this viewpoint has been revitalized in contemporary studies on infant and child psychiatry, psychopathology and psychosomatic medicine. In this connection, experimental genetic psychology (psychogenetics) is emerging as a new discipline.

4. Neurophysiological and neurochemical research activities, encouraged by the results of comparative genetic family studies in the major psychoses, continue to explore basic mechanisms in these disorders. Similarly promising is the alliance of genetics with investigations of normal brain function and its relation to general metabolism and endocrine activity.

5. At the molecular end of the scale of interdisciplinary research, the enzymologist, cytologist, physical chemist and physicist have joined the experimental geneticist in searching for explanations at this level.

Of serious concern from the eugenic standpoint is the genetic effect of ionizing radiation.

6. Clinically, the knowledge of genetics can be expected to be of help to the psychiatrist in the daily care of his patients.

7. On the whole, psychiatric progress in the various "subspecialties" will be enhanced by the utilization of genetic knowledge.

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SKIN HISTAMINE REACTION IN SCHIZOPHRENIC AND NON-SCHIZOPHRENIC MENTAL PATIENTS[1]

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The role of histamine in the physiology of schizophrenia has recently received some interest. Stern (8) and Lovett Doust (6) found that the level of free histamine in the blood of schizophrenic patients is higher than in normals. Lucy (7) reported that chronic schizophrenic patients show increased tolerance to histamine and that some chronic schizophrenics show little drop in blood pressure after the injection of a dose of histamine which could be lethal to normal people. Weckowicz and Hall (9) reported the results of an experiment with histamine skin reaction in schizophrenic patients, non-schizophrenic patients and normals. After a drop of histamine was placed on the skin and the skin was punctured the wheal formation in schizophrenic patients, both acute and chronic, was found to be slower and less than in non-schizophrenic patients and normals, thus indicating that the skin of the schizophrenic patients was less sensitive to histamine than the skin of non-schizophrenic patients and normals. They expressed hope that a skin histamine test for schizophrenia could be developed. As a possible explanation of the lesser skin reaction, it was suggested that in the skin of schizophrenic patients there was present an anti-histamine substance such as adrenochrome or other derivatives of adrenaline. The present paper deals with the question, whether the results obtained in the earlier investigation could be reproduced by a blind method.

[1] Research supported by National Health Grants, Ottawa, the Rockefeller Foundation, New York, and the Saskatchewan Committee on Schizophrenia Research. We would like to express our gratitude to the Rockefeller Foundation and to the Department of National Health and Welfare whose grants made these studies possible. We would like also to express our gratitude to Dr. H. F. Osmond, the Superintendent of the Saskatchewan Hospital, Weyburn; to Dr. A. Hoffer, Director of Psychiatric Research in Saskatchewan; and to Dr. R. Sommer, Research Psychologist at the Saskatchewan Hospital, Weyburn, for their help, encouragement and criticism.

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EXPERIMENT 1

TECHNIQUE

Three solutions of histamine base were used: 1:10,000 solution, 1:1,000 solution, and 1:100 solution.

A screen covered with thick brown paper separated the subject from the experimenter. The screen contained a hole big enough for the subject to get his arm through. The observer saw only the subject's arm illuminated by a strong electric light. After the skin was cleaned with spirit and dried, a drop of histamine of about 3 mm. in diameter was placed on the external aspect of the arm (more or less on the spot of the skin which is used for vaccination) by means of a 2 cc. standard syringe with a "24" gauge needle. The skin under the drop was punctured by an ordinary vaccination needle (supplied by Connaught Laboratories). The puncture was performed with one stabbing movement. While performing this puncture it was possible to feel the resistance of the cuticle, which suddenly gave way and so it was possible to gauge the depth of the penetration into the skin.

From the moment of the puncture the time was measured by a stop watch. At the end of the first minute, the histamine drop was wiped away with cotton wool and the skin examined for the appearance of a

wheal. If there was a wheal, it was measured by its longitudinal diameter (along the axis of the arm). At the end of the second, third, fourth, and fifth minutes, the skin was examined again and the wheal was measured. The wheal was measured in millimeters with accuracy to 0.5 mm., using a transparent plastic ruler.

As far as the scoring was concerned the same procedure as in the previous investigation was followed. Each measurement of the size of the wheal was given a weight relating inversely to the lapse of time between the puncture of the skin and the measurement. The measurements at the end of the first minute were given a weight of 5. Measurements at the end of the second minute were given a weight of 4, and so on, so that fifth minute measurements were given a weight of 1. To obtain the combined score, each measurement was multiplied by its weight and the obtained figures were summed. Thus the score combined the size of the wheal with the speed of its formation.

SAMPLES AND DESIGN OF THE EXPERIMENT

Forty-five schizophrenic patients, 30 non-schizophrenic patients and 15 normals were used. The schizophrenic patients were mostly chronic as were the non-schizophrenic patients.

The normals were members of the staff who volunteered for the experiment. The schizophrenic and non-schizophrenic patients were chosen at random by one of the writers (R.H.) in the following way: All the names of patients, both schizophrenic and non-schizophrenic, in the hospital were obtained. After all the cases where there was doubt regarding the diagnosis had been eliminated, the names of the remainder were written on slips of paper, rolled up, mixed and put in a hat from which the required number of names was drawn. The samples were randomized, but they were not matched. The normal subjects were mixed at random together with non-schizophrenic patients. There were therefore, 45 schizophrenics and 45 non-schizophrenics. Three solutions of histamine (1:10,000, 1:1,000 and 1:100) were used. All the subjects were divided at random, by the technique previously described, into 6 groups, with fifteen subjects in each group. Different strengths of histamine were assigned to each group. Thus, there were fifteen schizophrenics and 15 non-schizophrenics who received 1:10,000 strength of histamine, 15 schizophrenics and 15 non-schizophrenics who received 1:1,000 strength of histamine and 15 schizophrenics and 15 non-schizophrenics who received 1:100 strength of histamine. Further, the order of presentation of all the subjects was randomized.

The distribution of various strengths and the order of presentation of the subjects was completely unknown to the other experimentor (T.W.) who made the wheal measurements.

RESULTS

The mean scores for the three strengths of histamine are summarized in Table 1.

In order to test the significance of these differences a "two-way" analysis of variance, with replications, was carried out. It showed that the difference of the skin reactions both for different strengths of histamine and for the diagnostic groups (schizophrenics, non-schizophrenics) was significant. As all the differences are in one direction and in accordance with the prediction, one-tail "t" tests were used to test

TABLE 1

Mean Scores for Three Strengths of Histamine

Diagnosis	Strength of Histamine		
	1/10,000	1/1,000	1/100
Schizophrenics	18.1*	23.2	23.3
Non-Schizophrenics	22.0	25.7	31.9
"t" test of the difference between means (onetail test).	1.67 $p < .05$	0.86 (non-signif.)	2.77 $p < .01$

* The score is the sum of the weighted measurements at minute intervals, for five minutes.

their significance: the values of "t" and their significance are given in Table 1.

In order to find the relation between the strength of histamine used and the skin reaction in the two diagnostic groups, the data were fitted by the method of least squares into two rectelinear functions.

Two divergent rectelinear functions were obtained which indicated that stronger solutions of histamine are more effective in differentiating schizophrenics from non-schizophrenics.

Biserial correlations were also run between the skin reaction scores and the diagnostic categories (non-schizophrenics vs. schizophrenics). For the weakest solution (1:10,000) the coefficient of correlation is; $r_{bi} = +.37$, (S.E. $= \pm.20$). For the medium solution (1:1,000) the coefficient of correlation is; $r_{bi} = +.20$ (S.E. $= \pm.22$). For the strongest solution (1:100) the coefficient of correlation is; $r_{bi} = +.67$ (S.E. $= \pm.15$). These coefficients indicate that the strongest solution differentiates the groups better than either of the weaker solutions.

When the scores for the non-schizophrenics were divided into those from non-schizophrenic patients and those from normals it was found that the scores for the normals were consistently greater than the scores for the non-schizophrenic patients. However the numbers for each strength of histamine were too small to make statistical treatment feasible.

After the normals were removed from the sample the difference between the non-schizophrenic patients was seen to be non-significant. Thus the blind experiment did not confirm the results reported in the previous paper insofar as the difference between schizophrenic and non-schizophrenic patients was concerned. A possible source of error in the previous study could be the score used, which assigned a high weight to the early measurements.

To determine whether a stronger solution and a modified technique and scoring could differentiate between schizophrenic and non-schizophrenic psychotic patients, another blind experiment was carried out.

EXPERIMENT 2

As there was some indication that stronger solutions better differentiate schizophrenics from non-schizophrenics, a solution of histamine 1:10 was used, which was stronger than the solutions used in the previous experiment. The technique was basically the same as in the first experiment, but was modified in the following way: Instead of one longitudinal measurement, two measurements were taken, one longitudinal and one transverse, and the mean of these measurements was found. In addition the time in which the measurements were taken was extended from 5 to 10 minutes. As far as the scoring was concerned the unweighted diameters (mean values of the longitudinal and transverse measurements), measured at one minute intervals for ten minutes after the puncture, were used for statistical analysis.

Two samples were used, 30 schizophrenic patients and 30 non-schizophrenic mental patients (no normals were used). There were included in this group five cases of G.P.I. (arrested), fourteen mental defectives, two psychoneurotics, six epileptics, two cases of brain injury and one case of psychopathic personality with epilepsy. The patients were chosen at random for the experiment. The order of their presentation was randomized by the technique previously described.

RESULTS

The mean measurements for each minute for both schizophrenic and non-schizophrenic groups were calculated.

To find the significance of the differences between the groups, a two-way analysis of variance was carried out. This revealed a significant difference between groups and between the five one-minute intervals.

The means for each minute and each

group and the "t" ratios (one-tail tests) are presented in Table 2.

The mean differences (increments) between the sizes of the wheals at minute intervals and the "t" tests of these differences were calculated for both the schizophrenic and the non-schizophrenic groups. The results are summarized in Table 3.

TABLE 2

Mean Wheal Size at One Minute Intervals: Schizophrenics and Non-Schizophrenics

Minutes	Non-Schizophrenics		Schizophrenics		Difference of M	"t"
	M_1	S_1^2	M_2^2	S_2^2		
1	0	0	0	0	0	0
2	1.96	2.44	1.81	2.00	0.15	0.38
3	4.28	0.69	3.86	0.58	0.42	2.03*
4	5.35	1.49	4.55	0.54	0.80	3.06**
5	6.19	2.19	5.66	1.22	0.53	1.57
6	7.03	2.14	6.24	1.32	0.79	2.32*
7	7.67	1.93	6.78	2.02	0.89	2.45**
8	7.97	2.32	7.12	2.53	0.85	2.11*
9	8.33	2.33	7.33	1.93	1.00	2.65**
10	8.59	2.57	7.54	1.92	1.05	2.71**

M—Mean measurement.
S^2—Variance.
* $P < .05$.
** $P < .01$.

TABLE 3

Mean Wheal Size Differences at Minute Intervals: Schizophrenics and Non-Schizophrenics

Minutes	Schizophrenics		Non-Schizophrenics	
	Mean	"t"	Mean	"t"
0–1	0	0	0	0
1–2	1.81	—	1.96	—
2–3	2.04	8.41	2.33	9.01
3–4	0.71	8.12	1.07	8.51
4–5	1.11	6.38	0.88	7.68
5–6	0.63	8.31	0.84	7.16
6–7	0.54	5.26	0.63	6.56
7–8	0.35	3.96	0.30	4.42
8–9	0.22	2.32*	0.36	5.97
9–10	0.21	2.62*	0.27	3.23

* As the interest was in finding when the plateau was reached (when there was no more increase in size, but the tendency to decrease) two-tail "t" test was used. All the differences, except for the difference (indicated by asterisks) between 8–9 minutes and the differences between 9–10 minutes in the schizophrenic group are significant at less than .01 level. The other two differences are significant at less than .05 level.

The rate of increase in wheal size gradually diminished and this deceleration appeared to be greater in the schizophrenic group.

The groups used for the experiment were selected at random and were not matched. Therefore, it was very important to determine whether some variables other than the diagnostic category could influence the results. The following variables were tested: age, sex, length of stay in the hospital and medication.

Spearman's rank difference correlations were run between the skin reaction (the largest wheal size was used) and age; and also between the skin reaction and length of stay in the hospital. Neither of these correlations proved to be significant.

The difference in skin reaction between the sexes and the difference in skin reaction between the groups receiving and not receiving medication was tested by "t" test, neither of these differences was significant. Therefore we may conclude that the difference in the skin reaction to histamine was due to the fact that one group was composed of schizophrenic patients and the other group of non-schizophrenic patients.

DISCUSSION

There is a difference, established by a completely objective method, between the skin reaction to histamine of schizophrenics and that of non-schizophrenics. Scores unweighted for time differentiate between the groups better than the weighted scores which were reported in the previous paper. Figure 1 shows that the differences between the groups increase with time. It is possible that if the time of measurements were extended beyond ten minutes, the difference would be even more marked. In the previous method of scoring (the weighted method) an undue weight was given to the first two measurements which do not appear to be reliable. As the non-schizophrenic patients

from the same hospital constitute a better control group than the normals, we feel that the results of the second experiment were more significant than the first. The possible interpretations of the finding that the skin of schizophrenics is less sensitive to histamine than the skin of non-schizophrenics, were discussed in our first paper (9).

Three possibilities were considered:

1. That the diminished reaction to histamine in schizophrenics was non-specific and was due to the non-specific diminished physiological response to stress as suggested by Hoskins (3).

2. That the diminished skin reaction to histamine was due to the structure and physiology of the capillaries in schizophrenics, as described by Lovett Doust (5).

3. That the diminished skin reaction to histamine in schizophrenics was due to the presence in the skin of an anti-histamine substance such as adrenochrome or other adrenaline derivatives as suggested by Hoffer and Osmond (2).

In this connection one can quote the interesting paper by Alberty and Takkunen (1), who report that in guinea pigs adrenochrome mono-semicarbazone prevents the increase of vascular permeability due to intradermal injection of histamine or to intradermal injection of the "endogenous histamine" liberating substance "48/80," thus showing the same property as other antihistamines.

The other possibility which could be entertained is that the diminished skin reaction in schizophrenics is related to the level of free histamine in their blood. Stern, Hukovic, Madjerek and Karabaic (8) have found that the level of free histamine in the blood of schizophrenics was higher than that in the blood of normals, mental defectives, and patients suffering from G.P.I. These authors suggest that the increased blood level of free histamine in schizophrenic patients may be related to their diminished sensitivity to histamine. They further suggested, that this increased level

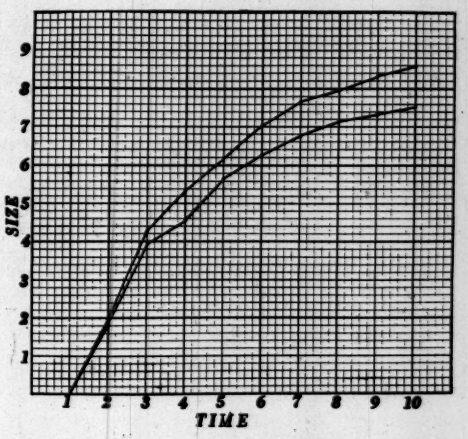

FIG. 1. Differences in skin reaction to histamine; schizophrenics and non-schizophrenics. Abscissa represents time in minutes; ordinate represents size of wheal in millimeters. Upper curve represents schizophrenics; lower curve non-schizophrenics.

of free histamine may be due to the presence of adrenochrome in the blood of the schizophrenics, because it has been shown by Kuschinsky (4), that adrenochrome acts as a histamine liberator.

Lovett Doust, Husdan, and Salna (6) have also reported that blood histamine in schizophrenics was significantly higher than in normals.

Schizophrenes can be differentiated by skin histamine reaction from other patients only as a group. There are some individual schizophrenics who have a strong histamine skin reaction and some individual non-schizophrenic patients who have a weak histamine skin reaction. The hope that it would be possible to develop a specific skin histamine test for schizophrenia appears to have been too sanguine. All tests, either physiological or psychological, for schizophrenia so far attempted, managed to differentiate schizophrenics as a group, but failed to diagnose the individual patients. One can refer to these tests as being peripheral, because they measure, usually indirectly, only secondary (dependent) variables. The real diagnostic test for

schizophrenia is yet to come. It will probably coincide with the discovery of the key metabolic disorder responsible for schizophrenic illness.

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HALLUCINATIONS OF POLIOMYELITIS PATIENTS DURING TREATMENT IN A RESPIRATOR[1]

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INTRODUCTION

This paper is an attempt to add a small amount of factual data to the literature on hallucinations. We intend neither a comprehensive review of the problem nor a reclassification of the phenomena of hallucinations. The observations made in one highly special type of patient have been recorded and an effort has been made to understand them in the light of both psychodynamic psychology and recent neurophysiological developments in the field of sensory deprivation.

Cameron (2) defined hallucination as "a response whose stimulus is within a person's fantasy behavior but is mistakenly attributed by the responding individual to sources outside of it." Until recently, few experimental approaches were available for studying hallucinatory phenomena, and hallucinations had little more definition than their literal derivation from the Latin *hallucinatio*—"to wander in mind, to talk idly, to dream." The difficulties in evaluating and understanding hallucinatory behavior were pointed out by Campbell (3), "In clinical psychiatry the term 'hallucination' is used to cover a great variety of experiences."

Since the classic experiences of S. W. Mitchell in 1896 (11) with the "Mescal Button", it has been hoped that drug–induced hallucinations would clarify many puzzling clinical observations. Numerous experiments, including the most recent studies with lysergic acid, mescaline, and epinephrine derivatives have indeed added to a fuller understanding of hallucinatory phenomena. Yet many factors concerning the genesis, frequency, perceptual role, and relationship of hallucinations to disease entities remain obscure. Since the work of Bleuler, very little has been added in terms of reclassification or description. Most current psychiatric texts offer little discussion of hallucinations other than a categorical, descriptive incorporation into discussions of the psychoses. Even less data exist for hallucinations occurring in toxic and delirious syndromes.

Hill (5) studied 415 hallucinations in 100 male psychotic patients. He divided hallucinations into two basic types, wish fulfillment and defense. He stated, "In the defense type of hallucination the auditory sense is most commonly involved and dementia praecox is the most frequent disease. In the wish fulfillment hallucination the visual, auditory, and bodily sensations are about equally frequently involved and the most common diseases are the toxic, organic, and manic depressive psychoses."

That hallucinatory experiences are not always indicative of overt psychosis was pointed out by Cameron: "A great many individuals can be found who report hearing and seeing things under conditions of intense excitement, expectation, or ecstasy which they would ordinarily recognize as their own fantasy." He continued, "Hallucinatory responses are facilitated by great anxiety and need. Fearful persons in threatened communities are usually reaction sensitive to signs of both calamity and reassurance since they dread the one and want the other."

[1] This study was aided in part by a grant from the Office of Naval Research, Nonr-1866(29).

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Thus defense and wish fulfillment hallucinations described by Hill in psychotic patients have their counterparts in everyday life and may be precipitated by a variety of stress situations. In the case studies to be presented in this paper hallucinations are seen to appear in non–psychotic individuals during the particular stress of therapeutic confinement in a tank-type respirator.

MATERIAL

During the 1955 epidemic of poliomyelitis in the Boston area a number of patients treated in tank–type respirators developed psychotic–like symptoms characterized by disorientation, confusion, hallucinations, and delusions. Behavioral, psychiatric, and physiological studies of these patients indicated that their symptoms did not arise from any specific toxic or metabolic factors but were the result of perceptual deprivation imposed by the unique conditions of life in a tank–type respirator. The factors supporting this conclusion as well as the initial descriptive features of the patient's symptoms have been reported in a previous publication (10).

The unusual form and content of the hallucinations experienced by these patients prompted a more careful investigation regarding the meaning of the phenomena. The present study is an analysis of the content of the transitory hallucinations and delusions experienced by eight patients with poliomyelitis who required therapy in a tank–type respirator. It will be seen that these hallucinations incorporated both wish fulfillment and defense characteristics. Though the personality and character structure of the patients were dissimilar, the hallucinations experienced by the group had many features in common. These features appeared to be related to the patient's attitudes and anxieties about their disease and its future implications.

Case 1. A 22 year old married white female was admitted with the diagnosis of spinal paralytic poliomyelitis with involvement of the muscles of the neck, trunk, and legs. She was placed in the respirator on the first day of hospitalization. The patient remembered being brought to the hospital and being placed in the respirator. She had good recall for all events occurring during her illness and vivid recall of the "dreams" she had during the initial phase of her respirator therapy. The patient was well oriented until her 5th day in the respirator. At this time she became disoriented to time, place and person. She had the feeling that everything in her environment was "unreal" and she asked the physicians and nurses what her name was and what place she was in. She began having "dreams" which had a more vivid quality than her real environment. During the first few days after the onset of this symptomatology she attempted to see if she were dreaming by asking the nurses and the attendants to tell her if she were awake and who she was. She said that her difficulty in knowing the real from the unreal progressed until the two became merged. During the first few days of these symptoms the "dreams" were more frequent and vivid as evening approached. She said, "I was afraid of the night. When it started getting dark, I started going sort of loopy."

The patient had both auditory and visual hallucinations. The visual hallucinations were three dimensional and in color. She told of traveling about the hospital in an automobile that had the shape of the respirator. She was riding in the "trunk" with her head protruding out of the rear. This automobile was driven to different places in the hospital and the patient recalled the nurses who accompanied her. She often spontaneously verbalized, "When are we going to get there?" When reassured and comforted by the nursing staff the patient again recognized her real environment and began her questions in an attempt to orient herself.

The patient's symptoms gradually diminished and completely ceased by her 10th respirator day. She continued to have vivid dreams until she was in the respirator every fourth night during the fifth month of her

illness. These occurred, however, only when she was asleep and she would have no difficulty in distinguishing them as dreams when she awoke. It is significant, however, that the patient did not dream, or could not recall her dreams when in bed, but only when placed back in the respirator. In turn these diminished in frequency and vividness as she regained strength in the muscles of her legs.

Case 2. A 28 year old married white female was admitted with the diagnosis of spinal paralytic poliomyelitis with involvement of the muscles of her trunk, arms, and legs. She was placed in a respirator on the first day of hospitalization and required a tracheotomy. The patient began having hallucinations and delusional experiences on her 7th day in the respirator and these lasted two weeks. The experiences were varied and vivid and the patient recalled them with great ease and clarity. The most prominent and recurrent "dream" involved the patient's visualization of herself being carried into a huge brightly–colored helicopter which had the shape and appearance of a tank respirator. The interior was covered with foam rubber and when the patient pressed a button the foam rubber separated to disclose a commode underneath. The patient then defecated, apparently with great pleasure and at such times actually did soil the bedding of her respirator. The patient also reported "dreaming" about attending dances at which she would run about and dance but there always seemed to be tank respirators scattered about the dance floor. The patient said she visualized, in more lucid intervals, her husband and son in the tank respirators next to her. The patient reported her "dreams" were "worse at night", and that during times of increased ward activity, *i.e.* during feeding times, she was more aware of her real environment.

Case 3. A 31 year old white married male was admitted with the diagnosis of spinal and bulbar poliomyelitis with involvement of the muscles of the throat, trunk, and legs. He was placed in the respirator on his third hospital day, and required a tracheotomy and a naso–gastric tube. The patient had poor recall of the events occurring at hospital admission and remembered few events until his fifth day in the respirator. At this time he began having hallucinations and delusions which he vividly recalled later.

He described these experiences as "dreams", and they followed a rather specific pattern. He was generally disoriented and confused during the day, but as evening approached he became less agitated and began to act out his delusional experiences. In retrospect he was aware that these "dreams" occurred as the ward became darker and less activity was present. In these "dreams" he suddenly found himself at home and the time was early morning. Though all of the normal characteristics of his home were present, there was an added clarity and vividness to his environment. All objects were in color and three dimensional. He noticed many small items such as "specks of dirt on the floor" and "bits of paper on the table" that he never noticed in everyday life. He then proceeded to spend a most enjoyable day at home, during which time he entertained himself by experimenting in cooking food delicacies (the patient was an amateur chef). He reported that he had a vividness of taste when sampling his cooking: "It tasted wonderful." The one alteration from his real home environment was that he was always wearing the neckplate or collar of his tank respirator, could never see his body clearly, and was intermittently engaged in an unsuccessful attempt to remove the neckplate.

The patient also recalled a second type of vivid "dream": He was returning home in his car with his wife from a garage where he had his automobile serviced. His wife was driving and he noticed that there were several scratches on the dashboard and that the pattern on the plaid seat covers was somehow different. He was convinced his own car had been stolen and the auto he was in had been substituted. This experience was so vivid that during his lucid intervals, when

his wife visited the ward, he continually insisted she notify the police. She naturally reassured the patient and refused. Several weeks after the patient's symptoms had completely ceased he was still convinced that his vivid experience was real and he persuaded his private nurse to telephone a close friend to come to the hospital. When his friend arrived he told him that his wife refused to notify the police about his stolen automobile and he pleaded with the friend to notify the proper authorities. It was only after many weeks that the patient was able to realize he had been "dreaming" and the experience was unreal.

Case 4. A 34 year old white married man was admitted with the diagnosis of spinal paralytic poliomyelitis with involvement of the muscles of the arms and legs. The patient developed severe paralysis of the intercostal muscles on his third hospital day and was placed in a respirator. The patient had poor recall of the events prior to and just after hospitalization, but began having vivid "dreams" two days after he was placed in the tank respirator. These "dreams" involved the patient's traveling on a world tour. He visited Europe, Asia and Africa and traveled on conveyances ranging from airplanes to camel back. During these episodes the patient actively verbalized what he was experiencing and reported the things he saw in an almost travelogue fashion. He was generally disoriented and confused during the intervals he was not "dreaming" and his recall of such intervals was very poor. He stated that near the end of his ten-day period of "dreaming" his "dreams" seemed to occur most frequently at night or in the evening or, as he said, "When the time of day would become more lonesome."

Case 5. A 31 year old married white male was admitted with the diagnosis of spinal paralytic poliomyelitis with complete quadriplegia and total respiratory musculature paralysis. He was placed in the respirator immediately. He began having vivid dreams on the second day. His recall of events for one week prior to that time was poor. His "dreams" involved traveling about the Boston area in an automobile to service vending machines (his occupation in real life). In his "dreams" a tank respirator was always present and in operation either in the background or directly next to him. In some instances the patient would arrive to service a vending machine and find a tank respirator in its place. During these "dreams" the patient verbalized material involved with the procedures of his occupation and at times used mild profanity when his servicing attempts were unsuccessful. The patient's mental symptoms lasted 14 days and seemed to diminish when the patient's wife or father attended him. Lucid intervals were longest during the late morning hours when the patient's father, a male nurse, washed the patient and changed the bedding in his respirator. The patient had vivid recall of all his "dreams" and could even remember many small items, such as the position of a loose bolt on one of the vending machines he was servicing.

Case 6. An 11 year old white male was admitted with the diagnosis of spinal paralytic poliomyelitis. He developed a complete quadriplegia one day after admission and was placed in a respirator on his second hospital day, after developing severe respiratory paralysis. The patient recalled being brought to the hospital but became progressively disoriented and confused after being placed in the tank respirator. He began having vivid, repetitive "dreams" on the seventh day in the respirator, and these recurred intermittently for ten days. They were more frequent at night, when the patient's visitors, his parents, were preparing to leave the ward. During the parents' visit he was fairly well oriented and conversed freely. When the parents left the ward he became disoriented and lapsed into a delusional state with visual and auditory hallucinations. He verbalized the conversations he was having and things he was experiencing. The episode usually continued throughout the night and stopped

in the early morning when the ward attendants rearranged the respirator bedding and fed the patient. The "dreams" always followed a similar pattern which the patient easily and vividly recalled. He thought he spoke to his parents, lapsed into a sleep when they left and then suddenly found himself riding home in his parents' automobile. He sat in the back seat and saw familiar landmarks as he approached his home. When he reached home he and his parents got out of the car and entered the house via the back door. The patient then went upstairs to his bedroom, lay in bed for a short time and then came downstairs to watch television. He then went back upstairs, got into bed and went to sleep. He awakened to find himself back in the hospital and thought all that occurred had actually been real. He frequently asked the nurse, "How did I get back to the hospital?" His "dreams" were in color and had a vivid quality regarding minute details. He easily recalled the content of the television shows he watched and the number of electric light bulbs glowing in a ceiling fixture. The patient verbalized many of the experiences he had in his "dreams" and what he said corresponded almost exactly to his recall of them many weeks later when he was asymptomatic.

Case 7. A 43 year old white married female was admitted with the diagnosis of spinal paralytic poliomyelitis with involvement of the legs. One week after admission the patient had the sudden onset of anxiety and hyperventilation. Associated with this her vital capacity fell to 1200 (42% of her predicted value) and she began to pool tracheal secretions. She was placed in a respirator where she remained for three weeks. In the respirator she became confused and finally mute. She would not eat, so that feeding by naso-gastric tube was necessary. She later recalled these episodes well. Seven days after being placed in the respirator the patient began to have a recurrent "dream" which occurred with greatest frequency during the night and early morning. The patient visualized herself riding in a tank respirator down the street on which her sister and mother lived. The respirator stopped at the end of the street, and the patient heard a rumbling sound and then saw the image of a gorilla looming above the housetops. She attempted to cry out and start her respirator moving. The gorilla crushed the houses on the street, seized her mother and sister and killed them. She then again started moving down the street in her respirator in absolute horror. She found herself back in the hospital and tearfully announced to the nurses that her mother had been killed. The patient recalled this dream as occurring in a three dimensional pattern and in vivid color. Recall produced a great deal of anxiety.

Case 8. A 39 year old white married female was admitted with the diagnosis of spinal paralytic poliomyelitis with involvement of the muscles of her arms and legs. The patient had slow but progressive respiratory muscle paralysis and she was placed in a tank respirator one week after admission. She was disoriented and confused at this time and she later recalled little of the events which occurred during her initial week of hospitalization. Three days after being placed in the tank respirator she began having vivid "dreams" involving the death of herself or of a close relative. The most vivid and recurrent "dream" involved the patient's own death. This "dream" occurred most frequently in the early morning hours. The patient visualized herself in an operating theatre undergoing an operation for a "brain tumor". She had subjective feelings of her "brains being cut" and yet she was also the objective observer. She died on the operating table and then visualized herself in a funeral parlor being mourned by friends and relatives. She next had the subjective impression of riding in a coffin inside a hearse. Upon arrival at the cemetery, she again visualized the lamentations of her mourners. The episode concluded as she felt herself being lowered into her grave and saw the light diminish and the walls of earth form up

about her. Frequently she reported to her husband during visiting hours the next day, "I died last night." On recall of these events many weeks later the patient was puzzled but not particularly disturbed by the content of her "dreams". She reported that their "sharpness" made it difficult to believe that they were not real, even after many weeks had elapsed.

DISCUSSION

The patients in the preceding cases exhibited a range of hallucinatory phenomena having visual, auditory, tactile, kinesthetic, and, in one case, olfactory and gustatory components. All the experiences were most vivid. The patients could not tell whether they were asleep or awake when they experienced the symptoms and they recalled that they seemed to occur in a quasi–twilight state. The visual hallucinations were dominant in all cases, with auditory hallucinations occurring frequently. The feeling of motion which also occurred in most cases could be interpreted as a tactile and kinesthetic illusion since there was a considerable degree of vibration as well as a dominant repetitive sound produced by the operation of the tank respirator motor and bellows. The perception of minute detail in the visual hallucinations was striking. Most of the visual hallucinations were in color, three dimensional and in a spatial sphere which was upright in respect to gravity. The patients emphasized that their ordinary dreams, experienced both before and after these symptoms, lacked color or any well–defined three dimensional spatial configuration. The auditory hallucinations were for the most part less prominent and vivid than the visual and kinesthetic hallucinations. Olfactory and gustatory hallucinations occurred in one case and it is interesting that these were in a patient who had been an amateur chef and who had to be fed by a naso–gastric tube during his illness.

Most of the hallucinations were pleasant. In only one case (Case 7) was there much anxiety associated with the hallucinations and it is of interest that in this case anxiety and depression contributed to the decision to place this patient in a respirator. This patient's psychotic symptomatology was both qualitatively and quantitatively different from those in the other patients and it is possible that two forms of psychotic entities were present in her.

How shall we understand the psychodynamic meaning of the hallucinations? Admittedly, a certain amount of imagination and speculation is required, but to us it seems that the hallucinations can be interpreted much as one would interpret a dream. Instead of the patient's associations to the dream, one may substitute the patient's real life situation, which in each instance included affliction with a serious illness, poliomyelitis, in its most dangerous form, respiratory paralysis, together with the threat of permanent muscular paralysis and death. In each instance, also, there was hospitalization and placement in a tank–type respirator with its monotonous drone of machine and bellows operation. In Case 1, the patient hallucinated that she was riding around in an automobile, with her head protruding out of the trunk. It is as though she were saying, "I *wish* I were riding in an automobile instead of being in the plight I'm in. I would even be willing to lie in the trunk compartment with my head sticking out in order to duplicate my present situation."

In Case 2, the patient seemed to be saying, "If only this were a helicopter. And if I could just dance again, and have my husband and son with me." In Case 3: "If I could just be home again, cooking wonderful things." Also, "I wish this were a car I am riding in. It could not be my own because it is different. Perhaps my panic is due to my own car being stolen. I certainly would prefer that to the actual situation I'm in." In Case 4, "I wish I were on a world tour."

In Case 5, in order to deny his critical predicament the patient seemed willing to return to his job of servicing vending ma-

chines and keep at it even though some of the details of the job stirred him to profanity. The patient in Case 6, seemed to react to his parents' departure by the thought, "If only I could go home with them. I could then watch television and go to sleep in my own bed."

The patient in Case 7 suffered a deeply regressed, though brief, psychotic episode, with muteness and refusal to eat. Her hallucinations seemed to say, "This is frightful! I would sacrifice my mother and sister and accept the horror if only I could be saved." Her fear was so great, as in a nightmare, that she could not assuage it through mental effort. Case 8, revealed a kind of ultimate in wish–fulfillment, denial, and desire to anticipate the worst with success. The patient saw herself dead, enjoyed her own funeral, and rehearsed her burial.

In appraising both the form and content of the patients' hallucinations several factors stand out. First, many of the experiences seem to represent a denial of reality with a superficial strong wish–fulfillment component. The prominence of motion in every case, whether in a car, helicopter, camel back, ambulatory respirator, or hearse, is striking. The false idea of locomotion can be interpreted as a tactile or kinesthetic illusion dependent upon the repetitive vibration and sound of the respirator motor and bellows. Second, most of the hallucinations possessed an ego–syntonic rather than ego–alien quality. Third, within the framework of denial and wish–fulfillment there was incorporation of reality regarding the severity of the patient's illness. This was manifest in the appearance of the tank respirator or its component parts in most of the visual hallucinations. Here we have a clue to the role and meaning of such hallucinatory phenomena as an ego–syntonic or defensive function. It appears as if many of the experiences encountered by the patients in their "dreams" represent an underlying speculative rehearsal–like anticipation for the future. The range of anxiety regarding such anticipation could cover large continuums of a complex spectrum. For example, it could range from anticipation of performance in a future job, such as noted in the vending machine service man who incorporated respirators into his daily work, to complete obliteration or death as dramatically experienced in the hallucinations of another patient. Such hallucinations could be interpreted as a protective anticipatory device for supporting the ego in the stress situations which seemed likely to arise in the future. It may be that hallucinatory phenomena observed in other psychotic states have similar defensive roles.

The everyday fantasy life of normal individuals may contain fantasies involving anticipated future stress situations and factors to prevent or reduce anticipated anxiety, a sort of mental rehearsal of "what could possibly happen". In the group of patients studied, the meaning of the illness and its future implications for a debilitating life in the future were enormous. The hallucinations they experienced, during a period when external stimuli were drastically diminished, would seem to represent a restitutional attempt on the part of the ego to predict and cope with anticipated stress. It is significant that the cardinal reality factor in the patient's stress, namely the muscular paralysis, was "denied" in every case by wish-fulfilling motion in the hallucinations.

In this connection, it is pertinent to point out that in all experiments involving sensory deprivation, whether subjects are confined in a small room (1), or in a tank of water (9), or in a respirator (12), restriction of mobility is a consistent common element. To a lesser extent, the same is true in instances of mental aberrations associated with the prolonged isolation of explorers (6), shipwrecked sailors (4) and "brainwashed" prisoners of war (8). The same comment is applicable to the origin of the transient psychotic states which have been attributed to sensory deprivation in certain clinical medical and surgical conditions (7). Restriction of mobility with its

concomitant kinesthetic sensations may be as important in the production of mental disturbances in sensory deprivation as the restrictions of the other senses.

SUMMARY

Hallucinations are described in eight patients with poliomyelitis treated in tank-type respirators. The chief elements of these hallucinations seem to be: denial of distressing reality with its ominous threats for the future; wish-fulfillment in terms of reassuring, pleasurable life situations; rehearsal-like anticipation of dreaded possibilities in speculative, preparatory fashion; and concession to the reality situation with regard to tolerable details. In psychoanalytic language, it is as though the harrassed ego, assailed both by the disease and by sensory deprivation, is forced to regress, to give up temporarily much of its hold on reality, but not its paramount function of sustaining life with hope of ultimate restitution.

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THE IMPACT OF PSYCHOANALYSIS UPON CHILD PSYCHOLOGY

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The relationship between psychoanalysis and academic psychology has received special attention of late, in part occasioned by the fact that 1956 was the Freud Centennial year. Explicit recognition has been given to the fact that not only psychology but all of the behavior sciences have been profoundly influenced by psychoanalysis. Insofar as psychology proper is concerned, it is only within the last decade that all universities, all schools of thought and all textbooks have found it necessary to come to terms with psychoanalysis in one way or another. It goes without saying that individual psychologists manifested an interest in psychoanalytic theory from the very beginning, some responding with positive interest and others with scorn and ridicule. However, it was during and after the second world war that American psychology seriously confronted the necessity of either validating and integrating psychoanalytic theory, or else refuting or modifying psychoanalysis. The importance of psychoanalysis to academic psychology can be measured not only by the number of studies and of publications that have sought to confirm psychoanalytic hypotheses, but also by the large number of experimental and other investigations aimed at disproving one or another component of psychoanalytic theory.

Changes in outlook within academic psychology which are the result of psychoanalytic assertions concerning the determinants of human behavior have been ably discussed by many distinguished scholars, and will not be reviewed here. Since psychoanalysis is a genetic theory, its implications for child psychology are in some ways more specific and compelling than is true in relation to many other aspects of psychology. Perhaps it is largely for this reason that child psychologists have shown a special interest in discovering scientifically rigorous ways and means of testing psychoanalytic postulates. Conversely it has been among psychoanalysts who are especially concerned with children that we have seen most clearly the other side of the coin, namely, a desire on the part of psychoanalysts to use and integrate the methods and the findings of academic psychology. In a lecture delivered at Clark University in 1953 Anna Freud advanced the view that several aspects of psychoanalytic psychology require study and validation through the methods and techniques peculiar to experimental and developmental psychology. She stated that an adequate comprehension and conceptualization of child behavior and child development can best be achieved by the combined use of analytic and other experimental and observational methods of investigation.

Prevailing trends and the most important among the general problems that arise as child psychology, and psychology in general, struggle to deal with issues and ideas first posed by psychoanalysis, have thus been sufficiently expounded. There remain some theoretical developments which can not be considered representative of dominant preoccupations within the field of child development nor, for that matter, within the area of psychoanalysis. We should like to identify some basic conceptual problems which imply also some practical issues of research strategy. The questions about to be discussed could not have arisen except for the social and theoretical impact of psycho-

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analysis. The material to follow is tentative and to some degree speculative and represents but one among many possible ways of delineating conceptual and methodological problems that confront psychoanalytically oriented personality research.

An attempt to identify potentially significant approaches partakes of the quality of a forecast of things to come. Anticipation of ideas and problems which may prove of special significance for the development of our science is no more than an extrapolation from the present state of affairs. Extrapolations in turn, are made in the light of what has been learned about the way in which science in general, and the psychological study of children in particular, have developed heretofore. A brief historical reference is unavoidable.

Present day child psychology poses problems for study, offers theoretical formulations, develops methods and techniques, and generates value systems, which are unthinkable without the peculiar combination of empirical knowledge, theory and social action which we call psychoanalysis. Yet it would be inaccurate to say that the development of psychoanalysis caused these changes within psychology. Freud's discoveries were more than the result of genius at work. Psychoanalysis emerged in the context of historical changes of which it is a conspicuous part more than it is the cause. The same societal and cultural changes which gave rise to Freud's monumental discoveries independently influenced the study of childhood in other ways. The very existence of a separate discipline of child psychology, as well as of many other branches of knowledge including psychoanalysis, is linked to a preceding radical change in man's perception of his universe and of himself: the theory of evolution. It is anything but an accident that the early work of G. Stanley Hall, the founder of child psychology, took place during much the same time span as did the earlier work of Freud.

The entire notion of development during the span of a single person's life could not have been articulated until evolutionary theory forced man to see himself not as a finished creation but as one of many links in a long developmental sequence. The study of childhood as a phase of life became a topic in its own right in direct relation to the impact of Lamark and later Darwin upon educators and social reformers such as Pestalozzi. The emergence of child psychology, of education, of psychoanalysis and of a host of other disciplines may be viewed as parallel phenomena, influencing one another and all contributing to a gradual change in man's view of his own behavior.

Psychoanalysis and all of the early formulations in child psychology have in common the assumption that experiences in early childhood have a profound and often irreversible effect upon personality functioning in maturity. It remained for psychoanalysis, however, to establish a climate of opinion in which an understanding of developmental processes in childhood is held to be the key to an understanding of all later behavior. Until not so long ago, child psychology occupied a low position in the academic pecking order. It was thought an especially suitable sphere of endeavor for sentimental women, lacking the academic dignity and scientific status of investigation in other psychological specialties. Currently it is generally believed that it is through the psychological study of children that we will obtain the answers to basic questions having to do with the nature of all learning, all adaptation, all maladjustment and any other facet of personality functioning. It is an interesting paradox that while the scientific importance of studying childhood has consistently increased over the last decade, child psychology as a separate discipline has all but disappeared during the same span of time. Nowadays the great majority of those who use children as objects of study do not refer to themselves as child psychologists; they are learning theorists, they are interested in the study of motivation, of the genesis of concept formation, the

etiology of neurosis, etc. In our view the disappearance of child psychology as a separate discipline is a sign of growth. In psychology as in other sciences, apparently diverse phenomena tend to be understood as different manifestations of the same laws or principles as the science matures. The fact that in psychology it has become arbitrary to divide the study of cognition from that of emotion, or the study of either from sensory psychology or from child psychology, is parallel to such developments in physics as the step which united the previously independent areas of the transmission of sound and the transmission of light.

Another and perhaps more important consequence of psychodynamic theory for child psychology has to do with the variety of problems and of hypotheses which came to be regarded as relevant topics of investigation. Until well into the 1930's, when psychoanalysis began to make itself widely felt in academic circles, few troubled with the problem of motivation; the majority of studies were of a descriptive and classificatory nature. The well known studies of Hartshorn and May (4) may serve as a representative example of child psychological work concerned with personality variables before the changes of which psychoanalysis was such a vital part had done their work. These studies were part of a comprehensive research program known as the Character Education Inquiry. Findings were published during the late twenties. Wishing to study deceitfulness in children, among other things, the authors devised eight different situations in which children were exposed to the temptation to cheat. These tests were administered to some eleven thousand school children, and the frequency of cheating was correlated with such variables as sex, I.Q., home background, scholastic standing and the like. Results included such findings as that deceitfulness is correlated more highly with classroom membership and classroom morale than with home background, intelligence or friendship pattern. The question of who cheats whom and why was simply not asked. The climate of the times was one in which such behavior as cheating was viewed as a trait, and manifestations of a trait do not have to be specifically motivated any more than does the color of one's eyes. The direction of change in problem setting which has occurred can well be exemplified by reference to a study of the same topic which was done ten years later at the Harvard Clinic. Cheating was one of the many behaviors scrutinized in the course of Henry Murray's personality studies of college students (5). The difference in the age of the subjects does not diminish the degree to which the Murray approach reflects representative changes in thinking. In this latter study subjects were observed while working at a task which made cheating possible. For this small group of subjects at least, it was found that the incidence of minor bodily restlessness, and of bodily self–stimulation was related to the absence or presence of cheating. In other words those subjects who did not cheat when this would have been possible, were the subjects who engaged in such behavior as nail biting, nose picking and the like, a great deal more often than did the subjects who engaged in small amounts of deception. In this study as in the early one, the incidence of certain behavior under relatively standard conditions was counted and related to other variables. Yet clearly in the Harvard study the relationship between bodily self–stimulation and cheating could not have been perceived were it not for some implicit assumptions about the meaning of cheating on the one hand, and the meaning of nail biting and the like on the other hand. These two behaviors could be seen as related only on the assumption that there operate within personality more central factors, some organizing principles, which lend meaning to both behaviors. If one were to adopt fashionable research terminology to describe the change, one might say that the effects of psychoanalytic thinking upon the activities of academic psychology are reflected by the

degree to which research results are of such a nature that they can be understood and reported only by reference to intervening variables. Previously, it was usually possible to report research results merely in terms of antecedent conditions and consequent behavior or conditions.

Against this background let us define some specific yet rather abstract issues which developments within psychoanalysis force upon the attention of psychologists working in the area of child development. The single most challenging component of psychoanalytic theory, insofar as child psychology is concerned, is the theory of psychosexual development. This portion of psychoanalytic theory is in the nature of a reconstruction. In ways which do not require specification here, clinical material obtained from neurotic patients—one might even say the totality of phenomena which became observable through the analytic method—proved comprehensible only if a regular sequence of normally occurring developmental phases was assumed. Each of these phases can be described in terms of dominant instinctual needs, in terms of specific vulnerabilities, and each is thought of as culminating in specific patterns of personality organization. For many years, psychoanalysis was fully occupied with the clarification and infinitely repeated observation of concepts and of phenomena that most directly relate to libidinal development. Far less attention was directed to the exploration of the vicissitudes of the aggressive drive, and still less effort went into the study and definition of ego development.

Psychoanalysts and psychologists are agreed that only the study of normal children can provide crucial evidence concerning the nature of psychosexual development and its significance for later adaptation. Many psychologists who found psychoanalytic theory congenial, have worked toward a verification of psychoanalytic theory, by attempting to "prove" the necessary relationship between certain kinds of infantile experience and certain patterns of adaptation and functioning at a later point in time. If one were to accept the challenge implied in the effort to provide scientifically unassailable proof for the existence of successive developmental stages possessing the characteristics psychoanalytically designated as oral, anal, phallic, etc., one would have to say that up to this point psychology has altogether failed to meet it. Whenever the intention of an empiric study has been to correlate behavioral measures with broad psychoanalytic concepts (of the order of orality) either one of two things has happened. If the investigators accepted psychoanalytic theory, it turned out that the empirical material fitted very nicely into the psychoanalytic scheme of things. However, none of these studies succeeded in conclusively "proving" that the behavioral phenomena in question could be understood or predicted only on the basis of psychoanalytic hypotheses. In instances where the investigators were, at the very least, skeptical of psychoanalysis, the resulting studies have frequently been more rigorous in design, and more conclusive as to results. It has indeed been possible to establish statistically reliable relationships between some behavior tendencies and one or another antecedent condition. Or, more frequently, behavioral predictions made presumably on the basis of a psychoanalytic hypothesis could be demonstrated to be inadequate and often false. Yet with respect to every study of this sort with which I am acquainted it can be said that the hypothesis being tested did not fully or even adequately represent the psychoanalytic view of the behavior in question. From the point of view of the researcher, psychoanalytic instinct theory evades crucial testing because it takes for granted that similar needs or conflicts may find expression in widely different behavioral reactions. Conversely, the same behavior may be viewed as reflecting totally different

underlying motivations, depending upon additional variables which are impossible to capture within an experimental design.

Overt and hence directly observable behavior in children stands in much the same relationship to psychoanalytic concepts such as orality or the oedipal conflict, as does the everyday behavior of adults in all situations with the single exception of the analytic session to the more general analytic concepts concerning unconscious determinants of behavior. In *both instances*, it is entirely possible to observe behavioral manifestations which can be understood in the light of psychoanalytic assumptions. In fact, often there is no theory other than psychoanalysis which even attempts to account for these behaviors in any consistent fashion. Yet observations of overt behavior can not possibly demonstrate or prove that there is such a thing as orality, or that the clearly observable peculiarities of the relationships between four and five year old children and their parent of the opposite sex are "due to" the oedipal constellation or that unrealistic business activities are "caused by" hostile impulses toward the father. No empirical investigation has yet succeeded or, if our view is correct, can ever succeed in verifying analytic postulates or hypotheses on the level of generality represented by the theory of infantile sexuality.

While it is true that behavioral psychological studies of children have failed to contribute to the validation of the genetic postulates which are at the heart of psychoanalysis, something else is also true: namely, that a great many things we have come to know about the behavior of children have no apparent relevance to psychoanalytic instinct theory. Until quite recently, there existed a large body of developmental data which could not be thought about in terms of such psychoanalytic formulations as were available. Babies do not only suck and bring things to the mouth. They also show the most impressive spontaneous urge to engage in any number of activities of quite a different sort. There is nothing in instinct theory proper to account for the way in which a three months old baby may light up with pleasure at the combined sight and sound of a rattle. Nor does it specifically account for the infant's fascination with the movement of his own hands and feet. It is not immediately apparent what energy may lie behind the unceasing urge to look, to touch, to grasp, and later to manipulate all objects within reach. Observers of infant behavior are regularly impressed with the signs of compelling motivation which spontaneously arise in the presence of suitable external stimuli. The child's behavior at such times has the distinct quality of something which he can not help doing and which is charged with strong affect every bit as much as would seem to be the case when he is responding to food, to the mother, or to his own thumb.

As soon as one abandons the attempt to directly relate behavioral events of this nature to id–psychological concepts, the pattern and the developmental significance of such infantile activity is much less difficult to apprehend. We see reflected in the child's behavior his growing capacity to recognize, to remember, to discriminate, to strive for goals, to anticipate, to control, to master, and to learn. These are ego manifestations of the same order as those observable in the overt behavior of human beings at any age. It was Anna Freud in *The Ego and It's Mechanisms of Defense* (2) who emphasized with special clarity that psychoanalysis always deals with phenomena as they emerge on the level of the ego. Even in free associations and in the report of dreams, what comes to the surface is that which is admitted to consciousness and which, as it were, has been given house room within the ego. The entire theory of the unconscious, of instinctual development and of defense, is built upon the fact that behavior processes remain inexplicable when viewed only in the context of situational factors and of such

thoughts and feelings as the behaving person is aware of. The seemingly irrational makes sense, the bits and pieces fall into a harmonious whole, when what is done, felt, thought and said leads to inferences concerning underlying impulses, unconscious thoughts and unrecognized conflicts. If we are correct in our belief that even in psychoanalysis proper, *i.e.* even when the study of personality is conducted by the psychoanalytic method, comprehension of id processes is mediated through ego manifestations, it is neither discouraging nor surprising that child psychology has failed to validate the psychoanalytic postulates dealing with psychosexual development.

We are under the impression that psychoanalytic theory is now developing in directions which will make it possible for psychologists to formulate hypotheses which are simultaneously capable of empiric test and meaningfully related to psychoanalytic theory. We refer to extensions and elaborations of ego psychology such as those that have been offered by Hartmann, Kris and Loewenstein (3), Erikson, Rapaport and others. We shall not attempt to summarize these theoretical developments within psychoanalysis here. Instead, a few assertions concerning them will be made in full recognition of the fact that these assertions reflect the writer's selective emphasis. Among recent psychoanalytic formulations, the following seem to us to have direct relevance for psychological research with children. To begin with, Hartmann's formulations concerning primary and secondary spheres of relatively autonomous or conflict free ego functioning seem to us to enlarge the scope of observable phenomena which can be encompassed within a psychoanalytic frame work. The concept of autonomous ego spheres addresses itself to growth processes and maturational functions. It refers to structurally, and hence biologically given, adaptive properties of the organism. In a manner of speaking it defines the arena or the background conditions which set the stage for the developmental drama of instinctual development and its vicissitudes. Similarly, Erikson's contributions, which are in many ways parallel and in other ways complementary to those offered by Hartmann, Kris, and Loewenstein, provide concepts and principles which will be applicable to all facets of the developmental process, from the biological—libidinal to the social—cultural dimensions.

We have previously stated that the empirical study of childhood behavior could not achieve direct and compelling relevance to basic psychoanalytic postulates because the major concepts which clothe these postulates do not refer to specific, overt behavioral acts. Ego psychoanalytic formulations of the type referred to above should herald significant changes in this respect. For the sake of clarity we should like to express the same notion in another way. Early psychoanalytic formulations of major developmental stages remain unaltered and altogether central to even the most ego–focused elaborations of more recent vintage. However, id–psychological formulations did not speak directly of what children do and how they do it, nor did they speak with any degree of specificity about the host of maturational and developmental phenomena which are the vehicle of instinctual needs and the medium in which conflicts between drive and reality obstacles to the attainment of gratification are played out. While each and every overt act in which a child engages can be viewed in part as an expression of whatever the underlying constellation of drives and defenses may be, there is no one–to–one relationship between, for instance, the dominance of oral needs and any specific behavioral characteristics.

Excessive thumbsucking will frequently reflect a primarily oral orientation. Yet it can also occur in children whose libidinal development has progressed far beyond this point. Under some circumstances thumbsucking proves to have a significance which does not primarily refer to oral needs. The pitfalls for behavioral research may be-

come more obvious if we approach the problem from the opposite direction. In other words, when we recall that the absence of such a behavioral index as thumbsucking does not have to mean that oral needs are not present, nor even that they are not dominant. An extremely interesting study by Robert Sears (7) concerned with the oral behavior of infants and young children, provides a good illustration. In this study comparisons were made among groups of children who were cup–fed from earliest infancy onward and groups of children who were bottle or breast fed and weaned early, as well as children who had experienced either type of early feeding and were weaned late. Among the findings was one to the effect that children who have had prolonged sucking experience and are weaned late, often show greater disturbance during the process of weaning, and often engage in more non–nutritive sucking behavior, than is the case with children whose sucking experience in infancy has been minimal. If the psychoanalytic meaning of the concept of orality is taken seriously, this finding does not demonstrate that oral needs are learned (secondary drives) rather than instinctual (primary drives) in nature. In our judgment, the facts obtained in this study and in many others of a similar type, are of great interest in their own right, but have no bearing on psychoanalytic postulates.

It appears to us that if a similar study were again undertaken, but this time the psychoanalytic formulations upon which the research design is based were derived largely from the work of Erikson (1), behavioral criteria as to the manifestations of orality would be of a different order. We do not suggest that it is now possible to empirically investigate orality in all its complexity. We do suggest, however, that results that bear a much closer relationship to psychoanalytic hypotheses could emerge if a study of this sort did not limit itself to the assessment of the frequency and intensity of mouth behavior, such as thumbsucking, speech, and distress directly related to the experience of weaning. Instead observations concerning the activation and stimulation of the oral *zone* might become only one among several behavioral measures. In addition, behavioral criteria might be found which would reflect the degree to which oral *modes* characterize the child's behavior regardless of whether the part of the body primarily involved happened to be the hands, the eyes or the skin. Similarly, it might be possible to find criteria which would reflect the polar experience of a sense of the ominous and of threat versus a sense of well–being and expansive good feeling (a sense of trust). Further, groups of children with different experiences in infancy, could be compared in terms of the degree to which their behavioral adaptation during the second year of life reflects an adequate developmental resolution in the direction which Erikson describes as a basic sense of trust. The burden of these considerations is that the more psychoanalytic theory will deal directly with ego development in its entirety, the more possible will it become for psychology to apply disciplined and rigorous methods in the study of child behavior. In turn, the greater the degree to which this possibility is realized, the greater the opportunity for systematic studies of child behavior to contribute to the further development of psychoanalytic theory. It is this we had in mind in stating earlier that recent developments within psychoanalysis foreshadow closer integration between research in child development on the one hand, and psychoanalysis on the other hand.

The prospect of a genuinely psychoanalytic child psychology invites consideration of recent trends not only within psychoanalytic theory, but also within research psychology. With the understanding that the formulations below are no more than tentative and speculative approaches to a complex problem, we should like to suggest some conceptual and methodological steps that may be taken within the near future.

Psychoanalytic ego psychology makes use

of structural concepts as well as of dynamic ones. We hear mention of such things as "ego apparatus" and as "equipment factors" (though one may hope that a more agreeable terminology may soon be developed). Apparently the human body and such functions as perception are difficult to conceptualize, in their psychic representation at least, except by the employment of images which suggest a thing rather than a process. In other words, something that has definite and relatively stable location in space. Yet, just as is the case with the three–partite division of the psyche into id, ego and superego, these are treacherously concrete images for relatively enduring characteristics of life processes. No one seriously believes that the id, ego, and superego are bounded regions, substances, or things within the person. In similar fashion it appears to us that the structural concepts used by Hartmann are no more than designations for specific characteristics of function. It is necessary to separate these functional characteristics from energy concepts, yet they can not be regarded as really existing entities. In other words, they do not have the properties of things or substances which are suggested by such words as apparatus or equipment.[2]

Students of behavior are confronted with a peculiar task when they attempt to work with structural concepts in relation to something as fluid and chameleon–like as is behavior. Ordinarily behavior has been treated as a process from which structural entities may be inferred, if the theoretician chooses to do so. As an example we may refer to Rapaport's endeavors to refine the psychoanalytic theory of thought, and specifically to describe the phenomenon of cognitive learning.[3] Drawing heavily on Hartmann's formulations, Rapaport concludes that learning must be thought of as structure building. For instance, learning the multiplication table leads to a state of affairs in which a ready made intellectual tool is available for recall at will. It is then no longer necessary to go through the process of reasoning by which one arrives at the conclusion that eight times eight is sixty four. Rather, this has become pre–formed knowledge, an acquired structure which from that time onward has a relatively autonomous existence within the psyche. So far so good, yet it appears to us that descriptive references of this sort will prove insufficient as we progress to the more active exploration of phenomena and to the testing of hypotheses. If, for example, one wished to study the *process* of learning rather than to describe the consequence of having learned, one would again meet up with the familiar quandary. We can not touch these structures, nor measure their dimensions and, therefore, the laws which govern the growth of these structures prove elusive.

We are not in a position to specify how more rigorous and more productive use might be made of structural concepts, in the study of learning or the study of any other aspect of development. In the good company of other psychologists we are still struggling with the definition of the difficulty. At most we might suggest a revision in our conceptualization of behavior in its formal properties, with a groping sense that it would then be easier to come to grips with structural concepts. What we have in mind can be communicated only by way of an analogy to certain developments in theoretical biology. We refer to an orientation in biology which was largely the work of D'Arcy Thompson, and which found its most complete expression in his book *On*

[2] In order to avoid possible misunderstanding it may be added that we do not have in mind physiological sub–strata which may conceivably prove to correspond to the functions we have in mind. The present discussion is limited to the task of understanding the lawfulness of events on the psychological level. There may be a specific neuro–anatomical counterpart to what Rapaport believes Freud means by the concept of stimulus barrier. The discovery of such a physical structure would not relieve us of the necessity of using the concept of stimulus barrier on a psychological level as well.

[3] Unpublished manuscript.

Growth and Form (8). When Thompson first developed his ideas, the scientific treatment of living organisms was as yet entirely separate from the scientific comprehension of the behavior of inanimate matter. In physics, the *motion* of objects was dealt with in terms of a set of concepts and laws designated as kinetics, while the *form* of inorganic matter, *i.e.* of objects, was treated in terms of the related theory of statics. An elaborate body of knowledge existed, which accounted for the movements and the shapes of physical objects in terms of the action of forces upon substances, these substances having characteristic and specific resistances to force. Forces in turn were understood as operating within various media which again have measurable characteristics. At that time the biological treatment of the form or the structural aspect of living things was limited to derivatives of evolutionary theory. The shape of wings can be understood by virtue of the fact that it is well adapted to flying; the form of gills is maximally adapted to the function of breathing in the medium of water; etc.

A parallel may be drawn between the state of affairs just described for biology some time ago, and the manner in which psychologists today think about behavior. Behavior too is treated primarily from the point of view of its adaptive significance in the medium of the social and physical environment. It is our notion that in psychology there may come about a change in conceptualization which is to some extent parallel to the changes which Thompson introduced into the study of living forms. By way of an enormous over-simplification, the nature of Thompson's contribution may be summarized as follows: He pointed to the fact that knowing the purpose which a particular form serves, and knowing the conditions of life under which changes in form will occur by way of an adaptation to changing life conditions, is but one facet of the problem. Evolutionary theory provided an essentially teleological relationship between what is, what was before, and what comes afterwards. Such a theory is entirely meaningful, yet it leaves unanswered the question of the mechanisms, or the specific manner, in which organic forms come about in the first place, and in which they change. It is useful to know that wings are well adapted to the function of flying, but this fails to tell us what forces act upon growing tissue so as to produce just these and no other forms. Thompson then proceeded to treat the shape of leaves, of bone, of muscle and tissue, of tree trunks and of teeth as physical substances acted upon by physical forces. In ways too intricate to describe here, he was able to develop a consistent picture of the laws of physical growth and evolutionary change. Among the things he demonstrated was that organic forms are streamlined in precisely the same sense in which engineers apply the term. In designing a bridge, engineers begin by drawing a stress diagram which takes into account the heights and distances involved, the properties of the material from which it is to be built, the load it is to bear, climatic conditions and many other variables. The structure of the bridge to be is always an inverse of the stress diagram. Thompson demonstrated that the form and construction of such organic structures as the backbone of a cow, a dog, or a giraffe is also the inverse of the appropriate stress diagram. In this latter instance, the relevant variables are provided by the animal's total proportions, its vital functions and the habitat in which it lives. Organic forms are streamlined to the lines of tension and of stress which have acted upon them and continually act upon them. Among the interesting consequences which ensued from the consistent application of this approach to an extraordinarily wide range of organisms, one is especially suggestive to the student of behavior. Through the use of appropriate mathematical expressions it became possible to discern inherent relatedness and developmental continuity among forms so diverse that inspection alone reveals little

or no similarity. For example, the changes in the skeletal structure of the horse from its earliest known form to the present day variety can be traced in the following manner. The entire skeleton of each of these widely different animals can each be plotted within a system of coordinates. Once this is done, information on hand goes beyond the absolute dimensions of the form. It includes the exact relative position of each point and each line in relation to any other point and any other line as well as in relation to the whole. By using the method of geometric transformation, it was possible to establish the fact that each of these skeletons, which look totally unlike one another, possesses a kind of mathematical identity. In other words each of the skeletons occurring in the series forms a part of a developmentally continuous sequence. To quote: "In these transformations of ours, every point may change its place, every line its curvature, every area its magnitude, but on the other hand, every point and every line continues to exist and to maintain its relative order and position throughout all distortions and transformations." This is more than a pretty game. Empirically it was possible to show that when one organic form could not be transformed into another, that is, when corresponding points no longer occupy the same relative position to all other points, one is dealing with forms that are not part of a developmental or phylogenetic series.

In relation to the study of behavior, these developments in theoretical biology can serve only as a vague analogy. In the behavioral study of personality development, we are forever struggling with the problem of defining continuity or inner consistency of behavior. Those who study children longitudinally have valid data to show continuity between the way a certain child behaved at one year, at two years, and at five years. The child remains himself and retains individual characteristics despite changing developmental levels, despite the fact that he is reacting to different circumstances, and despite the fact that the actual behavior shown at different age levels may in its concrete manifestations be entirely dissimilar. Or again, if intensive study is made of the behavior of a single person under different conditions and while engaged in different activities, one is impressed with the fact that whether the person be writing a letter, or participating in an experiment, or talking with friends at a cocktail party, his behavior at all of these occasions has distinguishing features which cause each of his actions to appear as a reflection of whatever it is we mean by the term personality.

There have been a good many attempts to identify and to describe such continuity and consistency, yet with small success. Usually the "data" do not go beyond impressions received by observers, inferences that can be made, and it is on such slender evidence that we describe the inward relatedness among outwardly different behavior manifestations. So far as we can judge, the present tendency is to view and to describe behavior as something that flows, as a process. Yet, we also say that behavior has a pattern, and this latter term evokes an image of at least partially solid matter. The implied suggestion for behavioral research of the future (which is being introduced through the analogy to biology) concerns a possible change in the formal treatment of behavioral data. When Thompson spoke of living tissue as physical matter acted upon by physical forces, he did so on the explicit assumption that the phenomena of growth can not possibly be "explained" in terms of physical laws. Thompson was well aware of the fact that he was treating growth simultaneously as an energy concept, a life force, and as a series of concrete phenomena which can descriptively be dealt with in terms of physical laws. He knew of course that living tissue has properties altogether different from inanimate matter. Similarly, what we should like to see attempted in the study of behavior is that behavior be treated *as though* it were a substance, as though it had thing

properties, and that this be done with full recognition of the fact that behavior can not adequately be accounted for in such terms alone. If a behavior episode or sequence were to be seriously treated as though it were a thing of finite dimensions, it would be necessary to go beyond coordinate systems in space, and to operate with coordinate systems in time as well as space. It is perhaps possible to roughly approximate a definition of behavioral characteristics and tendencies in terms of such things as relative intensity, relative tempo, relative expansiveness or constriction, relative degree of differentiation and the like. Once this is done it may be possible to bring to light similarities and identities currently masked by the manner in which behavior is described. On the assumption that all of this can be accomplished, we envisage far more direct application of not only dynamic but also structural concepts from psychoanalysis to behavioral data than has been achieved to date.

Vague and programmatic as this notion may be, it is based upon some recent psychological work that has been done under the direct influence of ego psychoanalytic theory. So much is this the case, that in our own experience we did not read of developments in biology and then transfer the principle to psychology, as has been done in these pages. Instead while reading the biologist Thompson our subjective experience was one of *recognition*; we perceived a mode of conceptualization in mature form with which we were familiar from psychology, though in more rudimentary form. The clearest example is furnished by relatively recent developments in the use of psychological test material for ego psychoanalytical studies. It is probably no chance that those psychologists who developed a method of test analysis known as "formal"—as distinguished from "content"—were thoroughly familiar with psychoanalytic theory (6). Projective test data, such as Rorschach protocols, TAT stories or drawings are analyzed with respect to formal characteristics when, for the time being, one ignores whatever is revealed about conflict and defense, about important symbols, about hidden wishes and terrors and the like. Attention is focussed instead upon such things as language structure, the size of units employed in the production, the tempo, the perceptual determinants or literally the form of the product. In speaking of a TAT protocol for instance, it is one thing to say that female figures are predominantly described as powerful, hostile and devouring. It is quite a different thing to say that consistently stories have no ending, that consistently trivial antecedents precipitate major catastrophes and that the language used is typically overly abstract and lacking in specificity. In so treating a test protocol (and a test record is nothing but a completed behavior sequence), psychologists who perform an analysis of the data in terms of formal categories do neither more nor less than what has been suggested above as a promising way of treating behavioral data in general. In other words, they ascribe to the protocol characteristics of a static nature, *i.e.* attributes which have thing characteristics. A degree of optimism about the promise of such an approach for psychoanalytic studies of personality development rests in part with our conviction that the systematic study of personality functioning in psychoanalytic terms has shown a remarkable spurt of growth ever since certain limited behavior samples have been objectively assessed not only in terms of content, but also in terms of the analysis of form.

In summary, we first dealt with the gradual convergence between psychoanalysis proper and the academic discipline of child psychology. It was thought that developments within each of these areas of specialization, as well as the rapprochement between them, may be understood as a consequence of historic changes in the wake of

evolutionary theory. Next we discussed the failure of academic disciplines in psychology and child development to either verify or nullify basic postulates of psychoanalysis couched in the form of instinct theory. It was stated that until recently psychoanalytic concepts tended to be of such an order of generality as to preclude reversible relationships between overt behavior and the concepts, and hence of such generality as to preclude experimental test. Lastly we pointed to more recent developments in psychoanalytic theory which encompass and emphasize manifestations of ego functioning. These formulations, we indicated, may prove susceptible to scientific verification if behavioral research can objectify on-going behavior sequences in formal terms.

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A COMPARISON OF PSYCHOANALYSIS WITH THE DYNAMIC PSYCHOTHERAPIES[1]

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A comparison between Psychoanalysis and the Dynamic Psychotherapies is appropriate at this time as there appear to be some areas of disagreement and confusion in all psychiatric circles concerning the nature of the basic differences between these two forms of psychotherapy. A recognition of the need for a clarification of these issues is shown by the recent symposia (8, 18, 22, 28) on this subject held under the auspices of the American Psychoanalytic Association. The literature on this subject is extensive and for the most part recent. Alexander (1, 2) feels that no sharp division can be made between these two therapies and quotes a number of psychiatrists as saying there is no longer any essential difference between psychoanalysis and dynamic psychotherapy. Chassel (8) feels that dynamic psychotherapy offers "an approach as strong, or stronger than psychoanalysis" with "a greater range of applicability"—based upon "new knowledge of ego psychology." Frieda Fromm-Reichman (12) has also hinted that both the classical analysts and the dynamic psychotherapists accept the essential principles of psychoanalysis, *i.e.*, the significance of the childhood history for personality development, the use of the concepts of transference and resistance, and the importance of the unconscious as an integral part of the human mind. Therefore, any difference between the two types of therapy is chiefly based on the interpretation of these principles and is only a problem in semantics. Many psychoanalysts (13, 14, 23, 25), however, hold that these "principles" are so broad that there are indeed definitive and actual differences between the two. In their view, the two types of psychotherapy are at the opposite ends of a scale and qualitatively different from each other, with a central area of instances where modified psychoanalytic techniques and those of intensive, dynamic psychotherapy resemble each other. In examining candidates for the American Board of Psychiatry one year, I found a tendency to explain the difference in vague terms; *i.e.*, in one, the patient is lying down and is seen four to five times a week, and in the other he sits up and is seen only once or twice a week. One doctor volunteered that psychoanalysts are usually concerned with the unconscious and psychotherapists with more "practical" aspects of the patient's difficulties!

Dynamic or insight type of psychotherapy is considered in the main to be a derivative of psychoanalysis and is practiced both by psychiatrists and psychoanalysts with the use of various techniques adapted from psychoanalysis. The varieties of this popular type of therapy are legion in number and name (17). In all of these procedures an effort is made to elicit a free flow of verbal material which will give the therapist some holistic perspective and understanding of the origin, development and meaning of the symptoms and difficulties which beset the patient. An effort is made during this procedure to communicate a portion of the therapist's understanding to the patient. How and with what additions or deletions these two procedures are carried out are

[1] This article derives from a lecture delivered to Residents of the Massachusetts Psychiatric Training Faculty under the auspices of the Boston Psychoanalytic Society and Institute, Inc., May, 1957.

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largely dependent upon certain theoretical schemata and premises concerning the nature of the various mental illnesses and the therapeutic, technical devices that are useful in treating them.

For purposes of comparison, psychoanalysis can be considered a method of therapy in which conditions are made favorable for the development of a state called a *transference neurosis*, which focuses the present neurotic patterns of relationship on the person of the analyst. The present pattern is considered a regressive restoration of one from the infantile past.[3] In the transference neurosis, unconscious memories and relationships become conscious by means of a systematic interpretation of the resistances of the patient. Finally a resolution of both the transference neurosis and its infantile prototype occurs, accompanied by structural changes in the mental apparatus of the patient which make him capable of a better adaptation to life. The development of the transference neurosis is made favorable by a number of technical maneuvers, all of which have the purpose of creating a kind of emotional vacuum which tends to become filled by the fantasy creations of the patient. The constancy and continuity of the time of the interviews, the prone position with the analyst out of sight, the neutrality and passivity of the analyst and the observance of the fundamental rule of free association and intellectual honesty are some of the devices which lead to the intensification and development of the transient and initial transference reactions of the patient into a transference neurosis. Interpretation, after a period of preparation and in a transference setting, creates dynamic changes in the patient's mental apparatus and enables the patient's ego to perceive its emotional experiences and its impulses and their vicissitudes at the moment of arousal. The quality of immediacy characterizing these experiences engenders in the patient a conviction of the truth of the interpretations. This is aided by the analyst's cultivation of an artificial splitting of the ego into a critical, observing portion allied with the analyst and sharing somewhat his dispassion and neutrality, and an emotional, experiencing portion.[4] The analytic process in itself also permits a reintegration of the ego at levels other than the regressive one and promotes an enlarged concept of reality, as well as an increased ability to recall the past. More will be said later concerning this reintegration type of experience, and especially the period of preparation that precedes an interpretation

From this brief summary, it can be realized that the transference interpretation is the chief tool utilized in the psychoanalytic method of psychotherapy (20). It can also be realized that the interpretative material will, to a large extent, be dependent not only on the nature of the patient's disorder and personality and the production of material by the patient, but also upon the personality and the theoretical beliefs of the analyst. Therapeutic experience, which is of major importance, will be shaped largely by one's theoretical convictions concerning what is significant in the material produced by the patient. Such convictions will play a major role in the important period of preparation that determines whether an interpretation "takes" or is rejected, or accepted simply as intellectual *curiosa*. Thus, if one holds the traditional view and believes a neurosis is due to in-

[3] It is usually considered that the acute symptomatology has arisen due to some traumatic occurrence, insoluble problem or excruciating dilemma which has aroused to an unendurable pitch certain basic, anxiety-laden, sexual and aggressive fantasies stemming from the infantile past. For practical and clinical purposes, all neuroses, psychoses, etc., may be considered as chronic processes with acute exacerbations; *i.e.*, the symptomatic illness is associated with basic, characteristic attitudes, problems, and their solution.

[4] Such a split is normal in the majority of, if not in all, individuals, and to an extent characteristic of the process of thinking. In analysis, this split is cultivated and intensified.

fantile repression and believes in the libido theory, the sexual etiology of the neuroses and an unconscious mental life, the main work of the therapeutic situation will consist of undoing resistances, making the unconscious conscious, undoing repressions and reviving the original infantile, sexualized conflict situations as a necessary preliminary to a better adjustment. If one attributes a neurosis simply to the development of anxiety–laden, interpersonal relationships in childhood, highly significant fantasy material in connection with infantile sexuality and the patient's relationships to his own body or the bodies of others, in part or in toto, might well be neglected, or *vice versa*. In this paper, when psychoanalysis is mentioned, it will be taken for granted that it is of the classical type based on the teachings outlined by Freud (11).

Theoretically and actually, any or all of the elements referred to in the description of psychoanalysis can and do appear in the dynamic psychotherapies, especially when practiced by analysts; however, as a rule, in the dynamic psychotherapies there is little consistency in the approach and a great variability in both the techniques utilized and the desired goals. Psychoanalysts are trained in psychoanalytic institutes for three to five or more years in addition to their psychiatric training. There are few psychiatrists using dynamic psychotherapy who have received more than the basic, three–year residency training in psychiatry. These are general differences.

There are more specific differences. An important one is that of the role of the therapist. In psychotherapy the therapist tends to be much less of a neutral figure than in psychoanalysis. Due in part to the *vis-ā-vis* position and infrequent number of sessions, and in part to the uncertainty of his role and technique, the dynamic therapist is inclined towards activity, *i.e.*, teaching, setting an example, proving a point, establishing a friendly atmosphere or developing confidence. This diminishes the free floating attention characteristic of the psychoanalyst and encourages a greater interest in the manifest content of the patient's speech rather than in the unconscious import of his words. This is even more pronounced in the case of the chronic, extensive note taker. There is also a tendency for the dynamic therapist, when facing the patient, to become a reality object in the eyes of the patient. This tends to complicate the development of a transference neurosis. Some analysts believe a transference neurosis seldom occurs or appears minimally in the majority of dynamic psychotherapies (8). In some psychotherapies, transference is deliberately ignored (6). In dynamic psychotherapy, the therapeutic field is frequently made obscure and untrustworthy by many forms of activity of a highly complex significance, ranging from the offering of cigarettes to the exchange of gifts. Positive transference states are encouraged and maintained as useful adjuncts to the therapeutic process. Psychoanalysis considers such states as a resistance to be ultimately analyzed in order to free the patient from infantile dependency needs projected on his therapist. Psychoanalysis is the only form of therapy that as a rule consistently analyzes the transference in *all* of its aspects and attempts to resolve it, believing that its continued existence interferes with the final resolution of the infantile neurosis.

Another aspect of an increased attention to the reality problems engendered by the *vis-ā-vis* position and the tendency towards active measures and manipulative techniques on the part of dynamic psychotherapists is the development of complications in the working through of important pathogenic material. Psychotherapy in general is sometimes described as a process whereby a complex series of projective and introjective relationships of an individual is gradually untangled. Enhanced stress upon reality elements of the type

mentioned above and the use of manipulative techniques dim the perception of such relationships considerably. This is especially the case with therapists of limited experience in the recognition of the great extent of every patient's projections.

As a rule the goal in dynamic psychotherapy is oriented primarily towards symptom removal or reduction in symptom intensity, and only secondarily to any character change. The lack of a clear–cut transference neurosis that is useful from the point of view of effective interpretative results, coupled with infrequent sessions and the stress on reality elements, reduces the chances of any deep personality changes in most cases of psychotherapy. Whether this applies to those types of psychotherapy that are used by analysts or by well–trained or gifted persons who utilize extensively the techniques of psychoanalysis and see the patient over a long period of time may, of course, be debatable.

The neutrality of the analytic technique is seldom practiced in dynamic psychotherapy. Freud (10, 11) has advised that the analyst reflect the patient's individuality and not seek to remold him in accordance with the ideals of the therapist. The analyst therefore avoids giving advice and instead attempts to arouse the patient's power of initiative. The inability to make use of his personality at times puts a limitation to the immediate effectiveness of the analyst's work. The analyst also does not attempt to act as teacher, model or ideal to his patients. Such behavior is more in the realm of dynamic psychotherapy as there are many types of cases that need and can profit by such a pedagogic influence. The psychoanalyst analyzes rather than utilizes such influences.

Classical psychoanalytic technique is not based on habit or convention but is a system of procedures with a firm and well–substantiated theoretical foundation based upon clinical experience and intended primarily for the treatment of certain types of cases. Due to what has been called the "widening scope of psychoanalysis" (26), the classical psychoanalytic technique has been used with cases for which it was not originally intended, *e.g.*, in some cases with severe regressive features or certain character types prone to develop such features. Such cases may call for the modification of the classical technique or fall within the realm of the dynamic psychotherapies. However, this is not a reason for modifying the classical technique in all cases or the theories upon which it is based.

Although interpretation is the basic tool of psychonanalysis, there are many patients suffering from grave ego weaknesses in which this tool must be supplemented by advice, command, prohibition, suggestion, etc. Such cases may or may not be treated by minor modifications of the classical technique. Eissler (7) calls any modification of the basic tool of interpretation a *parameter*; *i.e.*, a common parameter used by Freud with phobic individuals was the advice or command that the patient, after a preparatory analysis, expose himself to the phobic situation. Eissler has laid down four rules for the uses of a parameter which he feels allow for a scientific evaluation and exact description of any deviation from the basic psychoanalytic techniques. These are as follows:

1. A parameter must be introduced only when the original technique does not suffice and must never transgress the unavoidable minimum.

2. It can be used only when it leads to self–elimination.

3. The final phase of treatment must proceed with no parameter.

4. The effect on the transference relation must never be such that it cannot be abolished by interpretation.

Eissler feels that any parameter increases the possibility that the therapeutic process may be falsified inasmuch as it may offer the patient's ego the possibility of substituting transient obedience or adjusted

behavior states for a structural change in the mental organization. The non–observance of such rules allows the dynamic psychotherapist to enjoy many clinical successes that the analyst cannot obtain, *i.e.*, the proper psychoanalytic technique works against much heavier resistances than the more versatile, catch–as–catch–can techniques of psychotherapy. Every introduction of a parameter increases the danger that a resistance has been only temporarily removed rather than analyzed.

In the classical neuroses, *i.e.*, of the hysterical, phobic or compulsive types, and with the classical analytic technique, a transference neurosis tends to develop spontaneously. In the psychoses and the narcissistic neuroses or so–called borderline conditions, tranference reactions are unpredictable and a transference neurosis when it occurs is a tenuous, unstable thing which often must be aided, induced or produced by specific actions, gestures or words. It can easily be lost sight of, remain undetected, or fail to develop. The therapeutic situation must frequently be manipulated to preserve any positive transference state that occurs (16). The introduction of such "parameters" is ordinarily more within the province of dynamic psychotherapy or the so–called modified psychoanalytic techniques which cannot be separated very well from the dynamic psychotherapies, simply because there are few case reports where the "parameters" used are adequately described and evaluated.

The psychotherapist in many respects is an advantageous position as compared to the analyst. His behavior can be readily modified to suit changing circumstances or behavior on the part of the patient. He can be active rather than neutral; he can limit his goals; he does not have to foster a regressive transference neurosis; he can be flexible in his technique; and he can take on practically any type of case he wishes, and in case transference reactions do develop can manipulate circumstances to suit any exigencies that arise. In the case of a "weak" or "fragmented" ego, he can act a role, provide support and manipulate the environment as much as is possible. Symptom amelioration, resolution of a crisis and assistance through troubled periods may be the only goal of the dynamic therapist, or his goal may be as ambitious as that of the psychoanalyst; *i.e.*, he may seek to change or modify the patient's characteristic outlook upon life. There is nothing to prevent this. However, the nearer the goals approximate those of analysis, the more likely the therapist is to run into technical difficulties for the elimination of which the classical technique of psychoanalysis was devised. At such times the best knowledge, experience and inherent psychotherapeutic skill may be severely strained. It is obvious that in this area modifications of psychoanalysis may blend with psychotherapy (27). Undoubtedly advances in technical skills may come from the efforts of the dynamic psychotherapists in the realm of so–called deep psychotherapy, provided that a careful account is kept of the technique employed. No psychoanalyst of repute will ever claim that the last word has been said concerning either theory or technique in a realm as vast as psychotherapy. In most cases the objection is to the substitution of the hunch and the makeshift, technical device for tested standards of technique, and semantic quicksands for a precise and working technical vocabulary.

It may be that as more psychiatrists are trained in the basic, theoretical concepts and techniques of psychoanalysis, and as more research is done with various types of psychotherapy, new and more efficient methods will supplant the classical psychoanalytic technique, especially in the treatment of serious behavior problems and the psychoses (21). At this moment, however, nothing startling has occurred. The use of hypnosis, narcosis, tranquilizing and potentiating drugs, physical therapies

and mechanical devices, such as the tape recorder, have added little to the effectiveness of individual psychotherapy, and even less to our knowledge of mental disease. Here I am not speaking of acute symptom modification where many of the newer tranquilizing agents have proved effective, although even here the modification of symptoms may be more transient than the ad men of the various drug firms would like us to believe. As dynamic theories postulate that the neurotic's and the psychotic's symptoms are the logical end result of a pathological way of life, it will be of great interest to observe the complications that may arise and are inherent in the modification of symptoms by chemical means. This is especially so in connection with the problem of psychosomatic illness.

It is obvious that the more the technique of psychotherapy approximates the ideals, if not the practice, of psychoanalysis, and the more the psychotherapist is well-grounded in the theories, techniques and types of experience of the psychoanalytic school, the more difficult it will be to distinguish the resultant handiwork. Eissler (7) has formulated the belief of many psychoanalysts in his statement that "psychoanalytic scrutiny will disclose that the majority of cures by psychotherapy have been based on elaborate rationalizations which depend for their effectiveness on what is dynamically a repression of the basic conflict after some partial solutions of derivative conflicts have been attained and accepted as a compromise." In this sense psychotherapy has simply effected "a change in the content of the neurosis or a rechannelization of libidinal energy based on displacement, or has led to a new repression, or an exchange of illusions, the building up of magic beliefs or the development of an imitation of health." Of course all such "cures" may be extremely worthwhile, lasting in effect and economically more feasible than results obtained in analysis. Whether or not an ego incapable of psychoanalytic modification is also incapable of any other kinds of change than those mentioned previously has as yet not been ascertained. The criticisms mentioned are applied mainly to the briefer and more superficial psychotherapies (3). In one sense they are a reaction to what Gill (13) terms "the glib claims of those who measure the therapeutic results in terms of symptoms and adjustment and overlook at what cost to and limitation of the ego."

In skilled hands or with experienced and gifted therapists, dynamic psychotherapeutic techniques carried on over extensive periods of time can achieve outstanding results; however, the theoretical explanation of such results can easily be defective due to bad reporting and unsolved or emotionally based attitudes and counter-transference problems on the part of the therapist. Alexander's (1, 2) attempt to generalize from certain kinds of psychotherapy to a denial of certain aspects of psychoanalytic technique and Fromm–Reichman's (12) anxieties concerning the use of the regressive transference neurosis in the treatment of the neuroses as well as the psychoses are good examples of this type of error.

Bibring (4) has approached the problem of the differentiation of the psychotherapies from an holistic point of view. He has distinguished five different groups of basic therapeutic techniques: (1) the suggestive; (2) the abreactive; (3) the manipulative; (4) the clarifying and (5) the interpretative. These are employed in various mixtures in all of the therapies. There are also five basic curative agents related to these techniques: (1) induced beliefs, impulses or actions, etc., brought about by suggestion; (2) relief from acute tension brought about by abreaction; (3) learning through experiences brought about by manipulation and (4) and (5) insight brought about by clarification and interpretation respectively. He distinguishes four major types of activities in the psychotherapeutic process: (1) the production of material; (2) the utilization of the pro-

duced material (mainly by the therapist); (3) the assimilation by the patient of the results of this utilization; and (4) the process of reorientation and readjustment. The various curative agents can be used in a technical sense to promote the treatment process or to produce therapeutic changes, although as a rule both procedures overlap; *i.e.*, suggestions can be used to produce dream material or be used directly to remove a symptom. *Clarification* refers to preconscious material on the periphery of awareness, whereas *interpretation* refers exclusively to repressed or otherwise warded-off conscious material. In general it represents a prolonged process preceded by a period of preparation, meeting up with unconscious resistance and followed by a period of working through. Interpretation differs dynamically from clarification and initiates a reorientation of the personality resulting in efficient solutions of the basic infantile, as well as derivative, conflicts. Although psychoanalysis makes use of all the above mentioned principles, insight through the transference interpretation is the main therapeutic tool. In the various dynamic psychotherapies, a change in the selection or combination of therapeutic principles implicitly goes along with a change of goals; *i.e.*, clarification can be stressed and combined with manipulation as in Rogers' Client Centered Therapy (24) or abreaction can be stressed as in various procedures employing hypnosis or intravenous barbiturates. As a second differentiating point, the various dynamic psychotherapies tend to modify one or more of the therapeutic processes and procedures of analysis in an effort to accelerate therapy. The production and the use of material by the therapist are the processes most easily modified, and the processes of assimilation and readjustment are the ones most difficult to change. It is of great interest that the activities which accelerate the former tend on the whole to interfere with the latter. In fact this is one of the difficulties that occurs in any attempt to abbreviate the psychoanalytic method of psychotherapy. For this reason Alexander's (2) prediction that "the future absorption of psychoanalytic theory and technique" by psychiatry as "dictated by the immanent logic of the field" is still far off.

Bibring (4) feels that in most current dynamic psychotherapies there is a shift from insight through interpretation to experiential manipulation and an attempt to alter the theory of the neurosis by reviving the original trauma theory of Freud and replacing the concept of repression by that of dissociation.

One can readily agree with the idea that a short psychotherapy based on psychoanalytic knowledge would be of great value (3). Alexander (2) feels that an analyst should be able to establish a dynamic diagnosis which would enable him "to predict with a certain degree of probability what the patient's reaction to certain measures will be." Thus, "combinations of limited interpretations, provocation of certain types of transference, provision of well-chosen substitute outlets, alteration of the environment, suggestions or prohibitions of unconsciously tempting or reassuring situations or activities, the verbalizing of actual conflicts and advice about mental hygiene can very well be systematized". This appears easier on paper than in actual practice. Actually too few reports of cases of dynamic psychotherapy by analytically trained therapists are available, especially where the technique is clearly described and thus available for criticism and duplication. The Sector Therapy of F. Deutsch (5) is the only one of this type to my knowledge that is based on the theoretical postulates of classical psychoanalysis. In this case a therapeutic maneuver midway between clarification and interpretation is used. This is called *confrontation*; *i.e.*, a patient is confronted with his own statements which are juxtaposed in a manner so that he becomes conscious of an import of which he

has previously been unaware. The technique of Sector Psychotherapy has been described in detail and illustrated with verbatim interviews (5, 6). An overconcern with results and the tendency to report only successfully treated cases often confuses the issues. As far as obvious results are concerned, apparently there is little to choose among any of the dynamic psychotherapies, such factors as the type of case material and the ability of the therapist being of greater import.

The dynamic psychotherapies are derived from psychoanalysis and its variations in technique mimic those of analysis; *i.e.*, there is a tendency to stress either intellectual, verbal aspects or emotional and transference aspects according to the personality of the therapist and the resultant bias which favors various theoretical aspects of psychoanalysis. The great majority of analysts agree that insight through interpretation is the main curative factor in psychoanalysis and that experiential manipulation in or outside the transference setting serves the secondary role of a "fixative" such as is used in photography.

In my own experience, the most outstanding characteristic of the dynamic psychotherapies is not the lack of interpretation but the neglect of the period of preparation and the working through process. The success of any interpretation is vitally bound up with the analysis of the defenses and resistances of the patient. This neglected detail has been repeatedly stressed by E. Bibring (4, 21) and H. Tartakoff (28). This is reminiscent of how the all-important infantryman tends to be neglected in favor of the more spectacular branches of the military service during a war. To obtain recall of material and acceptance of the interpretations that lead to insight, a long period of preparation is usually necessary no matter how positive the transference. How this period of preparation is handled is one of the most important aspects of the psychoanalytic technique, and one seldom mentioned when analysis is contrasted with dynamic psychotherapy. It is marked by a number of measures which lead to the integration of large masses of intellectual and emotional material and is characterized mainly by a systematic analysis of the resistances and defenses of the patient against insight into the meaning and relationship of this material. In these preparatory phases leading to insight through interpretation, both clarification and confrontation may be used freely. In one sense clarification and confrontation deal with partial relationships and interpretation can be conceived as related to inductive reasoning and supplying a missing factor which permits the comprehension of a relative totality of relationships. Although interpretation may be used in some of the dynamic psychotherapies, a lack of training, experience or a coherent theory creates a tendency to cut short this vital period of preparation. If and when this occurs, an interpretation may then be accepted on the basis of logic or suggestion and the positive transference, but such an acceptance tends to be an evanescent and superficial one.

A consideration of this period of preparation of the patient for interpretation leads to a further consideration of the follow-up period known in analysis as the process of working through. This period also is essentially concerned with the analysis of resistance and defense against insight and is vitally connected with the problem of what is meant by a patient experiencing what is interpreted. The various defenses and resistances are beyond the scope of this paper. Mention should be made, however, that the manner in which they are organized is unique for each individual. In addition, during his lifetime, the individual develops a pattern of relationships in various spheres of activity, *i.e.*, with various persons, objects, animate and inanimate, various aspects of the self at all levels of development and with various aspects of the body in part or *in toto*. These relation-

ship patterns may be good, bad or neutral. As an offshoot of a defensive function of the ego related to the mechanism of isolation, there is a tendency to keep these spheres of activity separate. Thus there are not only the ordinary defenses of the ego such as those described by Anna Freud (9), but organized groups of defenses; *e.g.*, a young man was tremendously concerned with the relation of the "weak and hairless" upper part of his body to the muscular and hairy lower part. He felt depressed and abnormal because of this discrepancy. He later talked of the ethical and higher part of various persons and its relation to the animal, sexual and lower part. These persons were obviously *alter ego* figures and also substitutes for his parents. As his anxieties about various aspects of his good and bad self-images became linked up with this material, he remembered how in his bedroom he kept a copy of *Forever Amber* next to the *Pilgrim Hymnal*. A linking up of this material led eventually to the analysis of the displacement and isolation defenses by which he evaded conscious recognition of his anxiety and guilt feelings over his lack of control of his instinctual needs as exemplified by various sexual and aggressive, masturbatory fantasies. His manifest anxieties over the disparity of parts of his body thus became a defense against hidden anxieties in connection with the disparity between his good and bad selves, and this type of isolation was also apparent in his interpersonal relationships and those with his books.

A detailed analysis of the defenses and resistances involved in the working through process is seldom if ever accomplished in the dynamic psychotherapies and some types of psychotherapy masquerading under the name of psychoanalysis. Depending upon the theoretical background of the therapist, certain spheres of relationship may be slighted or ignored, and these spheres may contain the key to the patient's affective life. Many borderline cases and cases of psychosomatic disease evade material in the interpersonal relationship sphere and complain of their difficulties with their body image, but just as many talk glibly and without affect of their difficulties in the sphere of interpersonal relationship and evade certain aspects of their relationship to their body image which are of vital importance in connecting the actual life situation with past experience and transference manifestations. Such evasions mitigate against what Alexander (2) calls "total interpretations". Naturally, all interpretations should include as many spheres of relationship as possible. The relationship with one's body is the first of all possible relationships, and from birth on appears to manifest itself in a patterned form (19). It determines to a large extent the pattern of relationship with persons and objects encountered in the world around us. This statement should not be thought of as conflicting with the importance of what Greenacre (15) has termed "the persistent effect of severe organizing experiences of childhood".

A question that is now raised frequently is that relating to the necessity of a regressive transference neurosis. The answer to this is dependent upon the goals and the type of case. Alexander (2) asks whether or not transference is an attempt at belated mastery of an unsolved conflictual situation or a regressive evasion of a present day reality situation, and then goes on to give the correct answer, that both aspects are present in various combinations. He then asks how can one counteract the regressive evasion portion of the transference, and proposes certain manipulative techniques. To this the classical analyst might reply that unfortunately both aspects of the transference neurosis are inextricably conjoined and that the best weapon for solving such a problem is the transference interpretation preceded by the type of preparation and the working through process that have been mentioned. Actually, the appearance of the

so-called regressive transference neurosis is only one indication of a general regressive tendency on the part of the patient in dealing with all spheres of his relationships. What has been covert is now in the open and available for inspection by both analyst and patient.

In summary, there are definite theoretical and technical differences between classical psychoanalysis and the majority of the dynamic psychotherapies. The possibility of a confusion between the two has been enhanced by modifications of the psychoanalytic technique for the purpose of treating certain types of cases, and by the vagueness, lack of a clinically well-substantiated theory, and a general looseness of technique on the part of the dynamic psychotherapies. General and specific differences between these two types of psychotherapy have been described.

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THE PHENOMENON OF AUDITORY HALLUCINATIONS IN CHRONIC ALCOHOLISM

A Critical Evaluation Of The Status Of Alcoholic Hallucinosis

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I. INTRODUCTION

The effects of alcohol on the nervous system may be divided into two major categories. Firstly, there are those disturbances of nervous function due to the action of alcohol itself, which in turn may be simply those of acute intoxication, *viz.* drunkenness or coma, or those related to prolonged inebriety, including tremulousness, disorders of perception, convulsions and delirium. Secondly, there are the metabolic and nutritional disorders in which the role of alcohol appears to be incidental. Here inadequate diet or some disorder related thereto, such as cirrhosis of the liver, is the primary factor. The diseases that fall into the latter category, such as Wernicke's disease, Korsakoff's psychosis and polyneuropathy are relatively rare, but of serious medical consequence from the point of view of mortality and morbidity.

The commonest reason for hospitalization of the alcoholic patient is the development of one or a combination of symptoms of the first category, *i.e.* tremulousness, hallucinations, convulsions and delirium. In patients with these disorders a disturbance of the perceptual processes is a most frequent and interesting phenomenon. Here we have reference to defects in perception manifesting themselves by a variety of illusory, hallucinatory and delusional experiences. These phenomena merge with one another and the degree to which they are founded on objective reality differs from case to case. Some patients appear to suffer only from distortions of perception, *i.e.* illusions, in which they misidentify or misinterpret objects in their environment, frequently retaining insight into the unreality of these experiences. Others have rich and colorful sensory experiences presumably unrelated to immediate stimuli in their environment, *i.e.* hallucinations, which are the basis of false beliefs or delusions.

It is with these disturbances of perception and particularly hallucinatory phenomena that this communication is concerned. This study has been focused specifically on auditory hallucinations because this symptom is pivotal in one of the most perplexing of the alcoholic psychoses, namely alcoholic hallucinosis.

An examination of the literature on auditory hallucinations provided further motivation for the presentation of our data. The English literature is virtually silent on this matter. The subject has been given

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considerable attention in the German psychiatric literature, but there is little factual data available and certainly no uniformity of opinion regarding the nature of the illness. Kraepelin (15) and Wernicke (28) both recognized an alcoholic psychosis in which vivid auditory hallucinations were the major abnormality. Kraepelin called this condition the *hallucinatory insanity of drunkards* or *alcoholic mania* and Wernicke referred to it as the *acute hallucinosis of drunkards.* **Kraepelin** *believed* that auditory hallucinosis was related to delirium tremens, but with important points of difference, namely that in delirium tremens the duration of the illness was shorter and the hallucinations were more often visual than auditory. Bleuler (4), who named this condition *alcoholic hallucinosis,* confirmed Kraepelin's clinical description but stated that in such cases he could "demonstrate with certainty or greater probability that besides the alcoholism, a long standing schizophrenia was present." He concluded that "alcoholic hallucinosis could therefore be a mere syndrome of schizophrenia induced by alcohol."

Subsequent views on the nature of alcoholic hallucinosis were divided, in general tending to support one or other of these contentions. Following Kraepelin, Bonhoeffer (5), Räcke (23), Luther (18), and Filser (6) believed that a chronic psychosis, which was independent of schizophrenia, could be produced after years of drinking. Filser (6), and more recently Benedetti (2) and Auersperg and Solari (1), although they agreed with this point of view, pointed out that in many patients with acute auditory hallucinosis, one could observe the presence of both hallucinosis and delirium. Other authors, such as Pöhlisch (22), upheld the distinction made by Kraepelin between these two entities, and attempted to explain the type of alcoholic psychosis (hallucinosis or delirium tremens) by the patient's underlying "constitution." According to Schneider (24) the constitutional basis in patients who develop alcoholic hallucinosis is essentially the manic-depressive one. This is a view in direct opposition to that of Kretchmer (17) who believed that the schizoid temperament predominated in any alcoholic person who developed acute hallucinosis, while delirium tremens developed among the cyclothymics and among those without constitutional temperamental defects. Bleuler's point of view has also been reiterated by a large number of authors. Meggendorfer (19) believed that "a partial predisposition to schizophrenia" could be the basis for the development of alcoholic hallucinosis; Nothaas (20), that "alcohol releases a latent schizophrenia;" Wolfensberger (30), that "alcoholic psychosis consists of the reaction of a schizophrenic brain to alcohol." This view, negating the role of alcohol as an etiologic agent of a specific psychosis, has been accepted by the authors of several modern textbooks of psychiatry. Kirby (14) states that "the alcoholism and the hallucinosis alike are episodes in the course of a schizophrenic illness." Henderson and Gillespie (8) regard alcoholic hallucinosis as a misnomer and assume that alcohol is the agent that releases an underlying nervous instability. Noyes (21) states that the present day tendency is to consider alcoholic hallucinosis as "a psychogenic reaction liberated by alcohol rather than a purely toxic expression."

The number of conflicting and dissimilar views on the nature of auditory hallucinosis becomes evident from even this cursory examination of the literature. Noticeably lacking in the standard writings is a clear and embracing statement of the clinical problem, supported by the presentation of data. Having no strong feelings either for or against any of the views expressed, and without preconceived notions on the subject, a systematic attempt was made to gather data on this class of disease, as part of a large study of alcoholism in general.

II. METHODS OF STUDY

The data were derived from the study of 70 patients who presented an illness in which the central feature was the presence of auditory hallucinations in an otherwise clear sensorium—that is to say, the patients were well oriented, not confused or obtunded and had an intact memory. Four of these patients had repeated attacks, so that actually 76 episodes of auditory hallucinations were observed and studied. Sixty-one of these patients were seen on the medical wards of the Boston City Hospital. Nine patients were studied at the Worcester State Hospital and represented all the cases of acute alcoholic hallucinosis seen in this institution over a 2 year period.

The 61 Boston City Hospital patients were selected from a group of 1037 patients, seen in the course of a study on alcoholism. From this composite number, 2 groups were selected for special study. One of these consisted of 266 consecutive alcoholic admissions, studied to determine the relative frequency of the various alcoholic diseases; this group contributed 16 patients with auditory hallucinations. To determine the relative frequency of the different types of hallucinations, a group of 50 consecutive alcoholics, in whom hallucinations were the most prominent symptoms, were studied; 21 patients with auditory hallucinations were encountered in this group. Patients in whom auditory hallucinations occurred as part of a full-blown delirium tremens, (*i.e.* a state characterized by psychomotor and autonomic overactivity, disorientation and severe confusion, hallucinations and delusions) were excluded from this study. Patients with delirium tremens, in whom the auditory hallucinations were but a fragmentary sign of a whole series of perceptual abnormalities, were placed in a separate category to be commented upon later.

On the wards the patients were observed by the Medical Staff as well as by the authors. In each case a history was obtained, either from the patient or from an outside source, from both whenever possible. Information was gathered regarding a family history of alcoholism or mental disease, the type and duration of the drinking habits, the mode of onset of the illness and its relation to abstinence. An attempt was also made to ascertain the temperaments of our patients, using the criteria and nomenclature of Kretschmer (16). Using purely descriptive criteria, whether obtained from the patient himself or from outside sources, a designation of cyclothymic or schizothymic type was made. A patient was classified as cyclothymic if he showed the following characteristics of temperament:

1. Sociable, good natured, friendly, genial
2. Cheerful, humorous, jolly, hasty.

He was classified as schizothymic if the following temperamental qualities were prominent:

1. Unsociable, quiet, reserved, eccentric
2. Timid, shy, sensitive.

Although here the nomenclature of Kretchmer is employed, these types correspond descriptively to the extroverted and introverted types of Jung (13) and to the syntonic and dystonic types of Bleuler (4).

A general medical and psychiatric examination were done in each case; in the mental status examination attention was focused on the hallucinatory content and the appropriateness of the patient's behavior and emotional reaction to this content. The patient's course was followed day by day throughout hospitalization. The patients who were committed to State hospitals were seen and examined in those institutions.

The therapeutic regimen in most cases consisted of paraldehyde sedation and physical restraints as required, house diet, supplemented by parenteral vitamins. In 18 patients an attempt was made to assess the value of special forms of treatment with

drugs or diet. Two patients, in addition to the above regimen, were given tolserol, four were given ACTH, two were given adrenal cortical extract. In 10 patients, food was withheld throughout the course of their illness. Three of these received only water; six received only a mixture of 20% glucose and water (1 liter/day); one received glucose and water and whiskey (1½ ounces four times daily).

Eight of our patients presented a special clinical problem in that the course of their illness was very prolonged. The problems raised by this group stimulated a study of the alcoholic population at the Boston State Hospital, with particular reference to the patients with chronic auditory hallucinations. The State Hospital material will be the subject of a separate report, but will be alluded to in the discussion of the problem of chronic auditory hallucinations insofar as it applied to the Boston City Hospital patients.

Between April and July, 1955, *i.e.* four to five years after the patients were originally seen, a follow up study was carried out. Information was obtained on 43 of the 70 patients. Thirteen of these were given the Bernreuter personality inventory (3). The results of this test were compared with the assessment of personality and temperament previously obtained by employing the descriptive criteria of Kretschmer.

TABLE 1

Frequency of Auditory Hallucinations in 266 Consecutively Hospitalized Patients with Obvious Alcoholic Illnesses

	Number	Per Cent
1. As the major complaint in patients with a clear sensorium (well oriented, intact memory, not confused)	16	6
2. As an associated sign in delirium tremens	13	4.9

TABLE 2

Relative Frequency of Visual and Auditory Hallucinations in 50 Consecutive Patients with Transient Hallucinosis as the Predominant Symptom

	Number	Per Cent
1. Purely visual	29	58
2. Purely auditory	8	16
3. Mixed visual and auditory	13	26

III. OBSERVATIONS

THE FREQUENCY OF AUDITORY HALLUCINATIONS

The frequency with which auditory hallucinations are encountered in patients who enter a municipal hospital because of a nervous disorder traceable to alcoholism may be gauged from Table 1.

Of 266 consecutive patients admitted with an obvious alcoholic illness to the medical wards of the Boston City Hospital, 6 patients had auditory hallucinations as a chief complaint. It should be pointed out that these patients, aside from their hallucinations, were well oriented, aware of their surroundings and had an intact memory. As indicated in the previous section, instances in which auditory hallucinations occurred as part of a "full-blown" delirium tremens were excluded.

Among hallucinated patients in general, visual hallucinations are considerably more frequent than auditory ones. Their relative frequency is indicated in Table 2.

Within the group of mixed auditory and visual hallucinations two patients were also encountered with tactile hallucinations, and another with olfactory hallucinations.

Since 1950–1951, when our original surveys were made, many more alcoholics have been seen and examined. In an experience which now extends to over 1000 hospitalized alcoholics, approximately the same proportions have been maintained. Our present statistics indicate that the illness characterized mainly by the presence of auditory hallucinations is about as frequent as delirium tremens, approximately half as frequent as epilepsy in alcoholics, and only one-sixth as frequent as post-alcoholic tremulousness.

OTHER MANIFESTATIONS OF ALCOHOLISM IN PATIENTS WITH AUDITORY HALLUCINATIONS

The symptom of auditory hallucinations dominated the clinical picture in all of the 76 instances. In one-third of the patients, auditory hallucinations and the peculiarity of behavior associated with the hallucinations were the sole manifestations during the course of the observed illness. In the remainder, overt signs of alcoholism were present, such as tremulousness, transient visual hallucinations, and seizures. In four patients with auditory hallucinations a "full-blown" delirium tremens evolved. These features are indicated in Table 3.

TABLE 3

Other Manifestations of Alcoholism in Patients with Auditory Hallucinations (76 instances)

	No. of Patients
Auditory hallucinations alone	23
Auditory hallucinations and tremulousness	8
Auditory and visual hallucinations	11
Auditory and visual hallucinations and tremulousness	11
Auditory and visual hallucinations, delusions[1] and/or fits	19
Auditory hallucinations followed by delirium tremens	4

[1] Delusions in this group refers to false beliefs, but not those derived from hallucinations.

AGE, SEX, AND MARITAL STATUS

The age, sex, and marital status of our patients are summarized in Table 4 and 5.

The age of the female patients ranged from 27 to 52 years; the males from 23 to 63 years. We encountered relatively few patients with this illness in late adult life; only 10 per cent of our patients were over 50 years of age (1 female and 6 males).

The ratio of males to females in this group was 4 to 1. This was slightly less than the reported sex distribution of alcoholism in the general population in the U. S. A., which is 6 to 1 (12). However, we also found the same ratio (4:1) in various other non-nutritional alcoholic illnesses—such as tremor and visual hallucinosis, epilepsy and delirium tremens. In our experience, this predominance of males does not hold true in the nutritional diseases of the nervous system secondary to alcoholism (Wernicke's-Korsakoff's-polyneuropathy), this latter group being almost equally divided between males and females (27).

TABLE 4

Age and Sex of 70 Patients with Auditory Hallucinations

Sex	Number of Patients	Average Age
Females	14	38.3 years
Males	56	41.0 years

TABLE 5

Marital Status of 65 Patients with Auditory Hallucinations

	Females (14 patients)	Males (51 patients)
Married	6	13
Single	0	24
Divorced—due to alcoholism	5	8
Divorced—due to other causes	3	6

Regarding the marital status of our patients, several features listed in Table 5 should be emphasized. Almost half of the male patients had never been married. Furthermore, among the married patients, over half the marriages ended in divorce or separation; in the majority of such patients, the disruption of family life was directly attributable to alcoholism in either the patient or the partner.

PSYCHOLOGICAL OR "PERSONALITY" TYPES

As indicated in the previous section an attempt was made to classify our patients in regard to temperament, using the criteria and types suggested by Kretschmer. In only 31 patients did we have sufficient informa-

TABLE 6
Psychological Types (31 patients)

	Cyclothymes	Schizothymes
Men	20	2
Women	8	1

tion to allow for such classification; the results of this survey are listed in Table 6.

These figures illustrate the rarity of the schizothymic (introverted, dystonic) personality types in patients with auditory hallucinations, a point of departure from the view expressed by Kretschmer (17).

The characteristics of introversion and extroversion were further measured in 13 patients, using the personality inventory of Bernreuter (3). According to this author, persons scoring high on this scale tend to be introverted; that is "they are imaginative and tend to live within themselves." Those scoring low are extroverted; that is, "they rarely worry, seldom suffer emotional upsets, and rarely substitute daydreaming for action." The results of this testing are shown in Table 7.

It will be seen that only one male fell outside the range encompassed by the mean ± one standard deviation (which includes 68 per cent of the standardization population for this instrument). This patient fell out on the "introverted" end of the scale. Among the females one fell out of this range on the "extroverted" and two on the "introverted" side.

TABLE 7
Measurement of Introversion-extroversion in 13 Patients with Auditory Hallucinations (Bernreuter Personality Inventory)

Men		Women	
Case No.	Raw Score	Case No.	Raw Score
1	−52	1	−67
2	−35	2	−57
3	−34	3	−20
4	−17	4	−18
5	−2	5	+14
6	+121	6	+34
		7	+50
Mean (Bernreuter) −28.4		−15.8	
Range (Mean ± one S. D.) −78.4 to +21.6		−62.4 to +30.8	

Eleven patients were encountered in whom a psychiatric disorder was present—psychopathic personality in 3 patients, schizophrenia in 3 patients, endogenous depressive psychosis in 4 patients, and an unclassified paranoid psychosis in one. In each instance the psychiatric disorder antedated the hallucinatory episode.

The three patients with schizophrenia had transitory episodes of auditory hallucinations in relation to the excessive use of alcohol. On examination of these patients, signs of schizophrenia were present, and the history revealed the existence of schizophrenia prior to the alcoholic illness. The schizophrenia did not appear to alter the duration or other characteristic features of the episodes of alcoholic hallucinosis. These cases must be clearly distinguished from those in which there was no antecedent history of schizophrenia, in which the illness began as an acute alcoholic hallucinosis and later became chronic, at which time the similarity to schizophrenia was striking. This is an important distinction and will be commented on later.

A similar relationship between preexisting psychiatric disorder and alcoholic hallucinosis obtained in the patients with psychopathic personality, paranoid psychosis and depression. In the depressed patients the motivation for drinking appeared to be the ameliorating effect of the alcohol on the depressive symptoms.

THE ALCOHOLIC HISTORY

The main features concerning the type and duration of the patients' drinking habits, the previous attacks of alcoholic illness, and the familial incidence of alcoholism are tabulated in Tables 8–11.

A universal feature in the alcoholic histories of our patients, with perhaps only

one exception, was the fact that excessive drinking had extended over many years. Many patients could not accurately recall when the transition occurred from moderate to heavy drinking, and the figures given in the tables represent only the years over which the patients' drinking habits were qualitatively and quantitatively similar to those existing in the period immediately preceding their hospital admission. Actually, alcohol in lesser amounts was consumed for many years before this period. As can be seen in Table 9, there was no consistency from patient to patient in the type of alcoholic beverage consumed. Although whiskey was the preferred drink, most of our patients consumed ale and wine as well, the choice of beverage ultimately depending on what the patient could afford to purchase.

Most of our patients could be designated as steady drinkers, meaning that there was a constant, almost daily imbibition. A somewhat smaller number drank spasmodically for several consecutive days or weeks, with months of complete abstinence separating the individual drinking periods. In either circumstance, the hallucinations were experienced only after years of indulgence. Yet another small group of patients drank steadily and more or less moderately with superimposed periods of excessive imbibition.

Fully a third of the patients had experienced one or more previous attacks of an alcoholic illness. In ten of these patients the nature of the illness, including the hallucinatory content, was identical from one episode to the other, while in 12 patients the nature of the attacks was different. Four of the latter group had had a clear cut episode of "full-blown" delirium tremens; two had had previous episodes of visual hallucinations, while in 6 others the precise features of the previous alcoholic illness could not be determined.

In only 42 patients could an accurate history of the alcoholic habits of the family be obtained. In 26 of these, alcoholism was present in the immediate family. Almost always the father, but only rarely the mother, was implicated.

TABLE 8

Type and Duration of Drinking Habits in 62 Patients with Auditory Hallucinations

Type	Number	Average Duration
Spree drinker	22	10 years
Steady drinker	35	14.5 years
Steady and spree	5	21.5 years

TABLE 9

Type of Alcoholic Beverage Consumed

Whiskey only	11 patients
Ale only	8 patients
Wine only	4 patients
Whiskey + ale	15 patients
Whiskey + ale + wine	8 patients
Ale + wine	5 patients
Whiskey + wine	3 patients
Gin + other beverages	3 patients

TABLE 10

Previous Manifestations of Auditory Hallucinations or Other Symptoms of Abstinence (22 Cases)

Single attack	12 cases
Multiple attacks	10 cases
Previous Attacks (22 Cases)	
Identical (auditory hallucinations)	10 cases
Different (D.T.'s, visual hallucinations)	6 cases
Nature unknown	6 cases

TABLE 11

Incidence of Alcoholism in the Families of 48 Patients with Auditory Hallucinations

I. Negative Family History..	17 Cases
	6 Females
	11 Males
II. Positive Family History...	31 Cases
	5 Females
	26 Males
Father alone	20 cases
Father and brothers	2 cases
Father, mother and sister	1 case
Father and mother	1 case
Father and maternal uncles	2 cases
Brothers only	3 cases
Maternal uncle only	1 case
One sister only	1 case

FAMILY HISTORY OF MENTAL DISEASE

Unfortunately our histories were incomplete from this point of view. In only 18 patients was a systematic history regarding the familial incidence of mental disease obtained. In 13 of these patients no family history of mental illness was elicited. In 5 patients there was a family history of mental illness. One of our patients, who herself had both schizophrenia and alcoholic hallucinosis, also had a brother who was hospitalized with a mental illness diagnosed as schizophrenia. The father of a second patient had a depressive psychosis. The remaining 3 patients had one parent or another in a State hospital, but the diagnosis of their mental illness could not be determined.

MEDICAL AND SURGICAL COMPLICATIONS

Aside from the hallucinations and other manifestations of alcoholism, many of our patients showed signs of other medical and surgical illnesses.

Five patients were admitted to the hospital with injuries. Two of these incurred serious fractures in an attempt to escape from threatening voices; two others were accidentally injured while inebriated, and developed hallucinations only after a period of hospitalization.

Five patients had pneumonia. Two patients showed signs of advanced cirrhosis of the liver; in 13 others, the evidence of liver disease was limited to varying degrees of enlargement and abnormal "liver function" tests. In 2 patients there was a horizontal nystagmus, but there were no other signs of Wernicke's disease. In 2 patients physical examination revealed the presence of beefy red tongues.

THE NUTRITIONAL STATUS OF PATIENTS WITH AUDITORY HALLUCINATIONS

The nutritional state was estimated from the dietary history and the clinical examination. Precise histories were difficult to obtain, but there did emerge a consistent pattern in regard to their general dietary habits.

There appeared to be a clear difference in the dietary habits of the spree and the steady drinkers. In the spree drinker, food intake was adequate in the period between drinking bouts. While drinking however, the patient would consume practically no food, particularly in the latter part of the spree; at the outset he would attempt, with varying degrees of success, to follow a normal dietary pattern. It was usual for the spree drinker to report that he had gone without a morsel of nourishment apart from alcohol for a period of 2 or 3 days, or even for a week.

The dietary histories of the steady drinkers were not nearly so uniform. Of 35 steady drinkers, a clear account of inadequate diet was obtained in only 8. Interestingly, the 2 patients with cirrhosis, the 2 patients with lingual changes and 1 patient with nystagmus fell into this group. The remainder of the steady drinkers gave a history of adequate dietary intake.

Evidence of nutritional deficiency was not prominent on examination. There were the instances of liver, ocular and lingual disturbances mentioned above. A small number of patients showed a general thinness, roughening of the skin and acne rosacea. The characteristic skin manifestations of the specific avitaminoses were conspicuously lacking; so were the major neurological nutritional syndromes, such as Wernicke's encephalopathy, Korsakoff's psychosis, polyneuropathy and nutritional amblyopia.

THE TIME OF ONSET OF HALLUCINATIONS IN RELATION TO INEBRIATION AND ABSTINENCE

In 15 instances, the auditory hallucinations had their onset while the patient was still drinking, whereas 61 clearly had their onset in the period that followed cessation of drinking (estimated from the time the patient took his last drink). Three patients who stated that the onset of their

TABLE 12

Time of Onset of Hallucinations after Cessation of Drinking (53 Known Episodes)

12–24 hours	17 episodes
1–2 days	15 episodes
2–3 days	6 episodes
3–4 days	6 episodes
4–7 days	9 episodes

hallucinations followed a substantially reduced alcoholic intake were arbitrarily included in the first group since they were unable to qualify their statements more precisely.

In 53 patients the actual time of the last drink could be determined (see Table 12). In 32 of these (60 per cent) the onset of the hallucinations occurred within 12–48 hours following the withdrawal of alcohol; in the remainder the hallucinations appeared later, in some as late as 7 days following the cessation of drinking. These features are illustrated in Figure 1.

THE CONTENT OF THE AUDITORY HALLUCINATIONS

The hallucinations were almost always vocal in nature. Only 9 patients complained of other auditory phenomena, such as car motors (3 instances), buzzing and music (2 instances each), the ringing of the telephone or dogs barking (1 instance each). In 7 of these 9 patients the non-vocal hallucinations did not occur alone, but in combination with voices; in only 2 cases did they occur as the only disorder of perception.

The remarks that follow are entirely concerned with the nature of the vocal hallucinations. The data bearing on this aspect of the subject are summarized in Tables 13 to 16 inclusive.

The vocal hallucinations were of two distinct types (Table 13). In the majority of cases, the voices had an unpleasant connotation and were disturbing to the patient. A significant portion, however, were quite benign and not unpleasant, leaving the patient undisturbed. This aspect of our data is out of keeping with the statements in the literature regarding the universally terrifying nature of the voices. The actual content of the more common vocal hallucinations as reported by the patient can be judged from Table 14. It will be seen that these hallucinations were at times concerned with only a single unpleasant theme or limited to one type of derogatory remark, albeit repeated with relentless persistence. Just as frequently however the patient was assailed

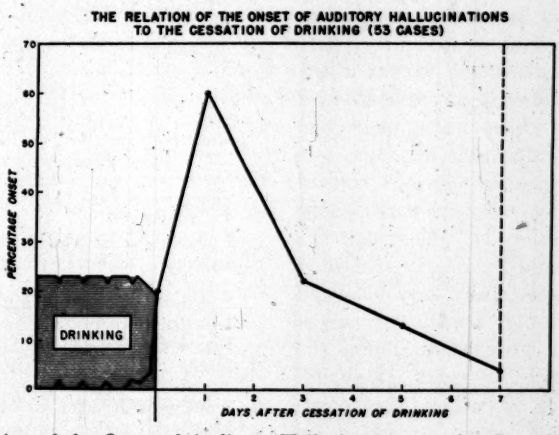

Fig. 1: The Relation of the Onset of Auditory Hallucinations to the Cessation of Drinking (53 cases).

TABLE 13

Type of Vocal Hallucinations (72 Instances)

I. Unpleasant and Disturbing (25 Instances)	
Threatening	12 instances
Derogatory, maligning	8 instances
Accusatory	3 instances
Admonishing, moralizing, scolding	2 instances
II. Benign and Non-Disturbing (20 Instances)	
Casual items of conversation	15 instances
Patient's name being called	5 instances

TABLE 14

Content of Unpleasant and Disturbing Vocal Hallucinations

1. Threatening
   "get him," "gang up on him," "kill him," castration, commitment.
2. Derogatory + Maligning
   "alcoholic," "bum," "queer," prostitute," filthy names.
3. Accusatory
   robbery, stealing, committing murder, infidelity, prostitution, "messing with women."
4. Moralizing, Admonishing, Scolding
   regarding alcoholic habits, living in common-law, etc.
5. Commanding
   "get out of bed," "go to the hospital."

with a combination of filthy names, threats, accusations and admonitions.

Beginning with Bleuler (4), the statement has frequently been made that it is characteristic for the patient with auditory hallucinations to be discussed in the third person. This view was not substantiated by our data; often the voices were direct. The commonly held opinion that alcoholic auditory hallucinations are vivid in nature was substantiated by our cases, particularly those of short duration. In almost half the cases the voices could be clearly identified (Table 15). Most commonly they belonged to the patient's family, friends, or neighbors. Some patients, however, attributed the voices to God, radio, or radar. It should also be noted that in 32 patients the voices, although vivid and clear, belonged to strangers who could not be identified.

The hallucinatory content tends to be most varied, a feature which is not in agreement with the statements in the literature that the voices all have a sexual connotation, tending to castigate the males as homosexuals and the females as sexually promiscuous. Indeed, the sexual connotations, when determiend by recording the patients' utterances during the illness, were relatively rare (see Table 16).

It may be appropriate at this point to mention that most of our patients had made a satisfactory heterosexual adjustment, as judged by direct questioning. This was true in all 9 females about whom such information was available. It was also true of 26 out of 31 males that were questioned in this

TABLE 15

Identification of the Voices in Auditory Hallucinosis (70 Patients)

I. Voices Unidentified—(32 Patients)	
II. Voices Identified—(30 Patients)	
a) belonging to members of family	15 patients
b) belonging to friends and neighbors	15 patients
III. Voices Attributable to Other Sources—(8 Patients)	
"Voice of God"	3 patients
Radio	2 patients
"Blessed Virgin"	1 patient
Radar	1 patient
"Head wired"	1 patient

TABLE 16

Incidence of Auditory Hallucinations with an Overt Sexual Connotation

I. Females (Sexual Connotation in *6 of 14* Patients)
   2 patients accused of prostitution
   1 patient admonished for living in common-law
   1 patient accused of infidelity
   1 patient worried re. daughter's prostitution
   1 patient "no good"
II. Males (Sexual Connotation in *9 of 54* Patients)
   4 patients called "queer"—"homo"
   3 patients threatened with castration
   1 patient accused of promiscuity
   1 patient implicated in lewd pictures

regard. In 2 males heterosexual adjustment had been poor for several years, while in 3 others the heterosexual adjustment had been adequate but had deteriorated with the progression of their alcoholism.

THE RELATION OF THE PATIENTS' BEHAVIOR TO THE HALLUCINATORY CONTENT

One of the most constant clinical features to be observed in the patients with auditory hallucinations was the appropriateness of their behavior—that is to say, behavior consistent with their hallucinatory content. Thus it was a common experience for patients who heard threatening voices to call on the police for protection, to barricade themselves in their rooms or to arm themselves against invaders. In other instances the behavior took on an even more dramatic form. Three of our patients threw themselves into the river, 3 others jumped out of windows incurring serious injury, while still another slashed his wrists. Interestingly, the patients did not recall being directly commanded by the voices to perform these acts; instead the acts were motivated by the patients' desire to avoid disgrace, mortal injury, or in general, the consequences of what the voices threatened.

In those instances where the hallucinatory content was of a benign nature, the patients' behavior was also consistent with the content of the hallucinations. If the voices were simply concerned with casual items, or were unrelated or undirected to the patient, he remained unperturbed. However, when the voices implicated the patient himself, his reaction to them changed appropriately and he became acutely disturbed. This general statement requires qualification in two ways: Firstly, there were four patients in whom there was a change in behavior during the course of the illness. At the onset, their behavior was appropriate; later in the course of their illness it became inappropriate. These four patients all belonged to a distinct group, in which the hallucinations persisted for a prolonged period. This group will be fully discussed later. Secondly, a small number of patients were upset by the hallucinatory experience itself, even though the content of the hallucinations was not particularly unpleasant. Such a reaction appeared to be related to the fact that these patients were at all times aware of the unreality of the hallucinations (see below); they realized the implications of the hallucinatory phenomenon, and expressed the belief that they were losing their minds.

THE DURATION OF THE AUDITORY HALLUCINATIONS

A striking feature of these data was the marked variation in the duration of the auditory hallucinations. This feature is indicated in Table 17.

The accuracy of these data could suitably be questioned, since it is well known that patients may hallucinate from time to time, particularly at night, and be examined in a lucid interval. This matter was decided by following the patient for some time after he was apparently well, and accepting the patient's verdict as to the time the hallucinations ceased. On only one occasion was a patient discharged from the hospital apparently well, only to return within a few days with active hallucinations.

In a small number of our patients the hallucinations were fragmentary, lasting for only a few minutes to a few hours. In the majority of cases, the hallucinations persisted for one to six days, and were for the most part intermittent.

In regard to the duration of hallucinations one group of patients was quite exceptional. It consisted of 8 patients in whom

TABLE 17

Duration of Hallucinatory Episodes (75 Instances)

1. Less than 1 day	14 instances
2. 1–6 days	50 instances
3. 10–25 days	3 instances
10 days	1 instance
17 days	1 instance
25 days	1 instance
4. 6 weeks or longer	8 instances

the hallucinations lasted from 6 weeks to 5 years (and were still present at the time of writing). In studying these patients an attempt was made to find some features, in addition to the duration of the hallucinations, which would set them apart from the patients with auditory hallucinations, or mixed auditory and visual hallucinations of short duration. No such distinctive features could be found in regard to age, sex, personality, or other general features, or in regard to their alcoholic habits or previous attacks. Several clinical characteristics did emerge, however, which were constant in 4 of the 8 patients with the prolonged form of the illness. It was found that after a period of active hallucinations and disturbed behavior, lasting from 4–7 days, these patients became more tranquil and resigned, and appeared unperturbed. This behavior was considered to be quite inappropriate, since the patients were still hallucinating and the hallucinatory content remained derogatory and threatening in nature. In addition these patients presented varied persecutionary delusions, not all of which were dictated by the auditory hallucinations. These features were quite unique, and appropriate case histories to illustrate these points will be presented.

INSIGHT, ORIENTATION AND MEMORY

Data bearing on the question of insight is presented in Table 18. Most of our patients had no appreciation of the unreality of their hallucinations and were quite impervious to the attempts of the examiner to convince them otherwise. There were a few patients, however, who were quite aware that the hallucinations were unreal even while they were hallucinating. In an equally small number of patients, afflicted with transient recurrent hallucinations, insight fluctuated; during the period of active hallucinations they were convinced of the reality of their hallucinations and reacted appropriately; as soon as the hallucinations ceased, insight was regained.

TABLE 18

Appreciation of the Unreality of the Hallucinations (Insight) in 70 Instances

1. No insight	56 instances
2. Claimed insight but behavior belied claim	2 instances
3. Insight intact except for the acute hallucinatory episode	6 instances
4. Insight intact throughout	6 instances

TABLE 19

Relation of Acquisition of Insight to Cessation of Hallucinations (56 Instances)

1. Concomitant with cessation	32 instances
2. Following cessation	24 instances
Within 1 day	12 instances
1–7 days	9 instances
17–22 days	2 instances
Over 3 months	1 instance

Most of our patients developed insight concomitant with the cessation of the hallucinations. In a significant number, however, considerable time elapsed before the patient acquired a full appreciation of the unreality of his hallucinations and the nature of his illness. Data concerning this feature is presented in Table 19.

In the patients who acquired insight only after an interval following the cessation of hallucinations, such acquisition came about in a characteristic manner. The patient first expressed doubts about the validity of his hallucinations, was disinclined to speak about them and often questioned his own sanity. The final stage of acquisition of insight emerged with the full recognition of the unreality of the hallucinations and the acceptance of the notion that alcohol was to blame.

The delay in the acquisition of insight was a feature we observed only in relation to auditory hallucinations, never in relation to visual ones.

With only rare exceptions orientation and memory were well preserved during the hallucinatory episodes. This feature was all the more remarkable considering the gross

aberrations that were present in the sphere of perception and behavior. Only two patients in our series were disoriented, one in time, and the other in place. In three patients orientation was impaired only to the extent of mistaking the time by a day or two. All of the patients but one were fully aware of their surroundings. They could give a clear and consistent history of the events leading to their hospitalization. Retentive memory was preserved during the hallucinatory episode, and upon recovery the patients were able to recall with striking clarity the content of their hallucinatory experience and other events concerning their hospitalization. The preservation of orientation and memory and the ability to recall their hallucinations at a later date are features which separate the patients whom we are describing from those with full-blown delirium tremens. The distinction between these clinical states will be further taken up in the discussion.

TABLE 20

Therapeutic Regimen	Duraton of Hallucinations
Water *ad lib* (3 patients)	48 hours
	3 days
	7 days
Dextrose (20%) and water (6 patients)	24 hours
	24 hours
	48 hours
	48 hours
	3 days
	8 days
Dextrose + water + whiskey*	3½ days

* 1½ ounces 3 times daily for 10 doses.

TREATMENT

As indicated in the Method of Study, our patients were treated in open medical wards. This fact, as well as the shortage of nursing help, necessitated the frequent use of restraints and paraldehyde sedation. All the patients, with 10 exceptions, were given the usual hospital diet supplemented by water *ad lib* and multiple vitamins.

In 10 patients all form of food and vitamins was withheld throughout their hospitalization. All of these patients made a complete recovery in a manner indistinguishable from those who were fed. The therapeutic regimens of these patients and the duration of their hallucinations are listed in Table 20.

Two of our patients were treated with adrenal cortical extract (10 ml. every 4 hr. intravenously followed by 5 ml. every 4 hr. intramuscularly). One of these recovered after 4 days; the second patient developed a severe delirium after 48 hours of treatment, which then persisted for 3 days despite further treatment with ACTH. Three other patients with auditory hallucinations were treated with ACTH (20 mg. intramuscularly every 6 hr.). One of these recovered in 4 days; two developed full-blown delirium tremens during the course of the treatment.

FOLLOW-UP STUDY

Of the 70 patients with auditory hallucinosis who formed the basis for this study, the majority were seen on the Wards of the Boston City Hospital during the period of July 1950 to July 1951. In the summer of 1955, *i.e.* four to five years after they had last been examined, many of these patients were again contacted and their status reviewed. Information was obtained on 43 of the 61 patients. Of these, 15 were personally seen and interviewed. Information regarding the other 28 came from patients' letters, from the patients' families, social service agencies, hospital and police records.

Eleven patients, or roughly one quarter of the follow-up group, had died. In this group there were 7 males and 4 females, ranging in age from 38–54 years. Only one of them had remained abstinent and she had died of rheumatic heart disease. The other ten had all continued to drink following their discharge from the hospital and died of causes directly or indirectly related

to alcoholism. The lethal illnesses in these cases were cirrhosis of the liver with ruptured esophageal varices (2 cases), suicide during the course of a drinking spree (2 cases), and rum fits and head injury, acute alcoholic intoxication, tuberculosis, gastrectomy due to bleeding ulcers, trauma and Wernicke's disease (1 case each).

Four patients were in the hospital at the time the follow-up study was conducted. One of these was in a State mental hospital with chronic auditory hallucinosis, and his case is described fully in the next section (Case 8). The other 3 patients had continued to drink in their accustomed manner and their last illnesses were related to alcoholism. These illnesses were peripheral neuropathy (1 case) and pulmonary tuberculosis (2 cases).

Of 28 patients who were neither dead nor hospitalized at the time they were contacted, only 3 had remained abstinent and were working effectively. Four others in this group were working regularly despite the fact that they were still drinking as before. Three patients were suffering of chronic auditory hallucinosis and had continued to drink, although less than previously. The remaining 18 patients in this particular group all exhibited a serious degree of medical and social disability, the consequence of prolonged alcoholism. Nine of them were leading a vagrant life and most of them had been arrested numerous times. Four others had contracted medical or surgical illnesses related to alcoholism and nutritional depletion (tuberculosis, bleeding ulcers, neck injury). The remaining five patients had suffered of various alcoholic illnesses (seizures, hallucinosis, delirium tremens), for which they had been repeatedly hospitalized.

IV. ILLUSTRATIVE CASES

Case 1, H.H., a 57 year old male, was admitted to the Boston City Hospital on April 8, 1951 with the history that while drinking he had slipped and injured his left shoulder. X-rays were taken on the accident floor ten hours after the injury and disclosed a fracture of the left clavicle. The fracture was set, and he was then admitted to a surgical ward.

The patient had been accustomed to drinking since youth, and for many years had consumed on the average of fifteen glasses of ale daily. He had lost several jobs because of inebriation but claimed that he ate well at all times. He had been drinking somewhat more than usual for 7–10 days prior to his injury.

The examination on admission to the ward was normal with the exception of the fractured clavicle. He was well oriented and gave a lucid and consistent history. He was quiet, showed no tremor, agitation or any abnormal cranial nerve, motor, reflex or sensory signs.

On April 9, 24 hours after admission to the hospital, the patient became actively hallucinated. He stated that certain people, whom he was unable to identify, were talking about killing him. The voices seemed to come from the floor below, and he interrupted the examination to put his ear against the floor and then to convey the hallucinatory content to the examiner. He appeared frightened; his pupils were dilated; he darted about the ward hiding behind beds and asked whether he could call the F.B.I. for protection. The voices would cease for a few minutes at a time, during which periods he was found to be neither tremulous nor disoriented, although he insisted on the reality of his hallucinations. This state persisted in an intermittent manner for five days. On the morning of April 15 he appeared neither agitated nor frightened. He remembered his hallucinations clearly and rejected our proposal that they were imaginary. The following day he could still recount the content of the hallucinations, but admitted that they "must have been my imagination." He was rather reluctant to talk about his illness because he felt that it was a reflection on his sanity.

Comment: This case is presented because many of its features are typical of a large group of patients with auditory hallucinosis: There was a background of many years of steady drinking, but significantly no disturbance of nutrition. The hallucinations developed 36 hours after the abrupt cessation of drinking. In this case the outstanding feature was the presence of auditory hallucinations, whereas other signs of the abstinence syndrome, such as tremor, visual hallucinations, fits or confusion were minimal or entirely lacking. The hallucinations were intermittent, intensely real, and the patient's behavior was appropriate to the hallucinatory content. Insight into the unreality of the hallucinations was lacking, though it was regained in a characteristic manner within a few days after their cessation. The content of the hallucinations was clearly remembered. The entire illness was brief, lasting only six days.

Case 2, G.F.R., a 56 year old widower, was admitted to the Boston City Hospital on November 22, 1951 because he had been disturbed by voices for a day prior to admission.

The patient had been drinking in gradually increasing amounts since age 17. Since 1941 he drank in recurrent episodes of 3–4 weeks duration; these episodes were usually separated by about three months of complete abstinence, although one spontaneous period of abstinence lasted 14 months. His father was an alcoholic, his mother was a teetotaler, and there were no other alcoholics amongst the eight siblings. His past history revealed that he had been treated intermittently for serological syphilis and once in 1945 for pulmonary tuberculosis.

His latest drinking episode began on November 2, 1951. For the first four days of the spree he drank both whiskey and ale; then, as his funds dwindled, he drank mainly ale, about 25 glasses daily. On the fourth or fifth day of the spree he noticed morning tremulousness. A few days later he began to suffer from painless vomiting on first arising. Both the morning vomiting and tremor, which appeared after a period of abstinence incurred by a night's sleep, were controlled by a few drinks, and they did not recur despite continued drinking for the remainder of the day. While he was drinking the patient ate very little, going for days on end without a morsel of solid food.

The patient drank in this fashion until the evening of November 21. In the four or five days preceding the complete cessation of drinking, his sleep was disturbed by visual and auditory hallucinations. In the evening, as he was trying to get to sleep, he thought he saw people on the fire escape outside his window. This would frighten him and he would shout at them to leave. On another occasion, he heard voices addressing him directly: "I'll kill you, you b....., if it's the last thing I do." These voices belonged to men who were unknown to him. If he took a few ounces of whisky the voices would cease and he would then be able to sleep for a few hours only to have the voices recur when he awoke. During the day, while drinking more continuously, he was untroubled by hallucinations until November 21. That evening, while crossing the street, the same voices again called him a variety of filthy names. He drove home in a taxi, but the voices followed him: "We got him now, the s.o.b." He heard them in his room again and was so frightened that he called the police for protection. He pleaded with the police to put him in a cell and they obliged him. He heard the voices all night long.

On the following morning the patient was released from jail. He was very tremulous. The voices still pursued him, and he appealed for help on the accident floor of the hospital. They were the same voices, of the two unknown men. For the most part they were derogatory and addressed the patient directly: "George R., I hope you die to-

night." Occasionally they simply commented on everything he did: "Look at the b...., crossing his legs." The voices persisted in this way throughout the night of November 22, and most of the next day. On the afternoon of November 23, he first realized that "they could be my imagination." That night he slept undisturbed for the first time in a week, and the next morning was entirely convinced that the voices were unreal.

In addition to the hallucinations, examination disclosed a slightly enlarged liver and a coarse tremor of the outstretched hands. Throughout his hallucinatory episode he was agitated and preoccupied. When his attention could be gained, he was found to be oriented in all spheres; his memory for recent events was intact, and he gave a consistent history regarding the events leading to his hospitalization. Food was withheld from the patient until the hallucinations ceased. His only medication consisted of nightly doses of 8 ml. of paraldehyde.

Comment: The alcoholic and dietary habits of this patient as well as his family history have been described in some detail because they are typical of the alcoholic population that provided the patients for this study. Nutritional factors appeared to be of minor importance in the genesis of the hallucinations, since the patient recovered completely despite the fact that he was given no food or vitamins throughout the hallucinatory episode. This case is unusual in that the relation of abstinence to the onset of hallucinations was not as definite as in most. Nevertheless, the symptoms appeared only after several hours of abstinence and at first could be abolished by imbibing more alcohol. After the complete cessation of drinking, the symptoms became prominent and continuous. Two other symptoms of the abstinence syndrome, namely, tremor and transient visual hallucinations accompanied the auditory hallucinations.

Case 3, H.B., a 45 year old married male, was admitted to the Boston City Hospital on June 21, 1951 following an epileptic seizure.

The patient had been accustomed to drinking between 1½–2 pints of whiskey daily. This did not interfere with his work, however, nor did he fail to eat properly. He had never suffered of any alcoholic illnesses with the exception of an episode in 1950, when he thought he heard the neighbors talking about his business affairs. He was disturbed about this at the time, but the voices lasted only 24 hours and he soon forgot about them.

Two weeks before the present hospital admission he developed nausea, vomiting and diarrhea and for this reason he stopped drinking. Two days later he began to hear a woman's voice coming from the floor below. She accused him of pounding on the floor and threatened to come upstairs and slap his face. When the patient's wife was dubious about the reality of the voices, he insisted that she go downstairs and investigate the situation. These voices persisted for about 24 hours and vanished as soon as he resumed his normal drinking habits. About one week later the gastrointestinal symptoms recurred, and once again he stopped drinking. After four days of abstinence the voices returned. He was unable to identify them, but they were very clear and made derogatory remarks, such as "Look at him, lying there when he should be working." All that day (June 21) the patient was described as "jumpy and nervous." In the evening he suffered a generalized tonic and clonic convulsion with loss of consciousness, following which he was admitted to the hospital. There was no history of previous seizures.

On admission to the hospital the patient was drowsy and confused. Aside from this, the general physical and neurological examinations were normal. X-ray films of the skull, the electroencephalogram and exami-

nation of the spinal fluid revealed no abnormalities.

On the morning following his admission to the hospital the patient was lucid, oriented and had an accurate recollection for all the events preceding the seizure, including his hallucinations. For the following three days the patient was denied food, and was only given daily infusions of 1500 ml. of 10 per cent glucose in saline and water by mouth. He did not hallucinate or exhibit other abnormalities during this period. He was seen again several weeks later. He had remained abstinent; he was working and appeared normal in all respects.

Comment: This patient had two transient episodes of auditory hallucinosis, each clearly related to abstinence from alcohol. The short duration of the hallucinatory episode, the vividness of the voices and the appropriate behavior of the patient in response to the voices were all characteristic. The point of special interest in this patient concerns the epileptic seizure, which occurred as part of the second episode. Such an event, occurring in the abstinence period, is most frequent in those patients who develop full blown delirium tremens. However, seizures may occur as the only component of the abstinence syndrome, or as in this case, in combination with auditory hallucinations. This case further emphasizes the secondary role played by nutritional deficiency in the causation of alcoholic hallucinations. This patient developed hallucinations and a seizure despite an adequate dietary background, and, as a corollary, he made a rapid and sustained recovery despite the denial of food.

Case 4, D.B., a 40 year old unmarried male, was admitted to the Boston City Hospital on the afternoon of October 14, 1951 because of uncontrollable tremulousness.

Until one year prior to this admission he drank heavily, but only on week ends. For the next year he had increased his consumption of liquor to 1–2 pints of whisky and 6–8 glasses of ale daily and decreased his food intake, so that he was eating only one adequate meal each day. After drinking his usual amount on October 12, he decided to stop drinking because "it wasn't doing me any good." On October 13 he had only one glass of ale. Later that day he became tremulous but completed his day's work. During the night he was unable to sleep, the tremor became progressively more severe, and for these reasons he sought admission to the hospital.

When first examined the patient showed a deeply flushed face, injected conjunctivae, and he was perspiring excessively. The face, lips, trunk and arms were affected by a coarse tremor, which became more prominent on movement or sustained posture of the limbs. He was fully oriented in all spheres and he gave an exact and consistent account of the events preceding his arrival to the hospital. There was no evidence of delusions or hallucinations at the time of admission.

At 1 A.M. on October 16 (36 hours after admission and approximately 72 hours after the cessation of drinking), the patient had a generalized convulsion with loss of consciousness, followed for several hours by drowsiness and confusion. At 9 A.M., however, when seen on ward rounds, the patient was alert and clear and remained that way for the remainder of the day. Until the time of the seizure, and for the day following, there was steady improvement in the tremor and other symptoms. The only treatment during this time consisted of intravenous infusions of 5 per cent glucose in normal saline.

In the late morning of October 17 the patient suddenly became quite restless. He paced the halls and talked about a group of men who had taken him to a restaurant and pushed him around. The stories were somewhat different each time he related them. Later he told of having just returned from the Indian Wars, and "they had Sitting Bull just where they wanted him." He

stated that he returned to the East in response to a telegram from his wife (actually he was unmarried) and that he had been captured by four men who tied him to a table. He was under the impression that he was tied down in this way in a tavern in Boston. He kept hearing voices of men whom he could not identify, who kept saying "We'll get him; we'll chop his arm off." They threatened to emasculate him and called him every conceivable filthy name. He misidentified the patient in the next bed, thinking that he had suffered a shoulder wound. The patient was able to sustain a conversation for a considerable time, although now and again he would suspend the interview, appear frightened and respond to the voices. This state persisted throughout the day of October 17. The only medication administered to the patient over this period of time was 90 proof whiskey, of which he consumed a total amount of one pint. About midnight the patient fell into a sound sleep. On awaking (October 18) he was quiet, oriented, without delusions and free of hallucinations. He described the previous day's experience as "a bad dream"; he remembered to a large extent the content of his delusions and hallucinations. He regarded the whole episode as imaginary and accepted our explanation that it resulted from his alcoholism. He remained well and was discharged three days later.

Comment: The period of abstinence in this patient was characterized by three fairly discrete phases. At first tremulousness was the most prominent symptom, orientation and memory being unaffected. Three days after cessation of drinking he had a seizure, from which he made a recovery. Only after four days of abstinence did he become confused, hallucinated and deluded; auditory hallucinations were present only as a part of this latter state. It is again of interest in this case that the tremor was subsiding in the usual manner while the patient was denied food and vitamins and was receiving only glucose and water. The confusional, hallucinatory, delusional state cleared up in 12 hours, while the patient was treated only with whiskey.

Case 5, P.H., a 36 year old male, was admitted to the wards of the Boston City Hospital on August 25, 1951 with lacerations of the wrists and a diagnosis of paranoid psychosis.

The patient had been drinking since age 16, and for 3–4 years prior to this hospital admission he had been drinking not less than 20 glasses of ale or a quart of wine daily. He had been working until one week prior to admission but gave up his work because of general weakness. On the morning of August 24, after a night's abstinence, he began to hear voices and to imagine that people were after him. The voices kept repeating his name, threatened to take his clothes off and drive him through the streets of South Boston with a placard around his neck stating "This is what a drunken Irishman looks like." In order to avoid this embarrassment, he slashed his wrists with a knife.

Three months previously the patient had had a similar episode of hallucinosis, which lasted 2–3 days. He had been married in 1941, but was divorced three years later because of his alcoholism. The patient's father was still alive and a chronic alcoholic. Three brothers were moderate drinkers, while his mother and two sisters were abstainers. The patient worked as a mail sorter and spent his entire free time in the tavern.

On admission the general medical examination was normal, aside from a mild acne rosacea and an enlarged liver. He was not unduly tremulous, sweating or agitated. For the most part he was attentive, fully oriented, and he sustained a coherent conversation. He was convinced that outside there was a gang of men waiting for him, intent on harming him. He appeared only

slightly fearful and stated that he felt quite safe in the hospital.

Two days later (August 27), he became more tremulous and sweaty, and later that evening he developed full-blown delirium tremens. His pulse rate rose to 110 per minute, he developed a coarse generalized tremor, and he was perspiring profusely. He was continually tugging at his restraints or picking at the bedclothes. Disorientation was profound; he thought that he was fully dressed and at work sorting mail. His attention could be gained for only a few seconds at a time, and he was continually distracted by hallucinations and illusions. On August 29 his temperature rose to 101° (rectally), although a source of infection could not be found. A state of severe delirium continued for about 60 hours (until the early hours of August 30), when the patient fell asleep for the first time since the onset of his delirium. Later that morning he awoke, lucid, with only slight tremor and perspiration. He was able to recall the details of the auditory hallucinations which prompted his admission to the hospital. He thought that they were real at the time, but on recovery he realized that they were a "joke" or "foolishness." He could recall nothing of his severe delirium.

The patient was treated with adrenal cortical extract and ACTH. Adrenal cortical extract was administered for the first two days after admission (August 26 and 27) in a dosage of 10 ml. intravenously every 4 hours for 4 doses, then 4 ml. every 6 hours intramuscularly. At the onset of severe delirium, in the evening of August 27, ACTH therapy was instituted. The first dose was 40 mg. intramuscularly, and subsequent doses were 20 mg. every 8 hours until the delirium subsided.

Comment: The symptoms of abstinence in this patient changed distinctly in the course of the illness. At first he was afflicted only with auditory hallucinations; they had the characteristic features noted in the other patients, they were not accompanied by tremor and they occurred in an otherwise clear sensorium. The hallucinations persisted for more than three days, despite treatment with adrenal cortical extract; furthermore while receiving this hormone the patient developed a state of intense psychomotor and autonomic overactivity and profound confusion, *i.e.* delirium tremens. During the second part of the illness, the patient was treated with ACTH. The delirium subsided in about 60 hours. In our experience, this is no different than the duration of 80 per cent of cases of delirium tremens treated without ACTH. The occurrence of auditory hallucinations in an otherwise clear sensorium, followed at a later stage in the abstinence period by full blown delirium tremens, is a sequence that we have observed in three other instances of auditory hallucinosis.

Case 6, C.W., a 50 year old unemployed male, was admitted to the Boston City Hospital on May 18, 1951 in a state of extreme apprehension, complaining of hearing voices that were threatening to harm him.

The voices were first detected two months prior to his admission. At that time, while in bed, he heard the voices of the couple on the floor below. Their words were garbled, but he thought that they were arguing. On the following night a similar phenomenon occurred. Gradually the voices became louder and clearer, and he then realized that the neighbors were arguing about the death of their child. The wife would say "You are a murderer," and the husband would reply "Repeat that and I will kill you." He heard the voices in both ears, quite distinctly. They would recur every night the instant he got into bed and they always dealt with the same topic. The voices did not disturb him at this time and did not seriously interfere with his sleep.

About two weeks before admission the patient's name was mentioned for the first time in the nightly arguments of his neigh-

bors. The wife would threaten her husband, by telling him that the patient was going to beat him up. To this the husband would reply that he was going to kill the patient. The patient now became disturbed and frightened. Three days prior to admission he heard the voices for the first time during the day. They followed him everywhere in the apartment, were intensely real and referred to him in the most derogatory terms. He would lead his mother and sister around the apartment, in an attempt to convince them of the presence of voices. He attributed their disbelief to defective hearing. Despite the fact that he had seen his neighbor leave for work in the morning, the patient could not rid himself of the neighbor's threatening remarks. For two days before admission the voices were present day and night. The patient asked his sister to hide all the knives in the house, for fear that the neighbor might use them as a weapon against him.

On the day of admission, in an attempt to get away from the voices, he sought refuge in a friend's home. Still the voices pursued him, and his friends sent him to the hospital. In the ambulance the patient heard new voices. They were voices of men, loud and clear, coming from the ambulance door; they spoke to one another about the patient, making derogatory remarks and threatening to kill him. He repeatedly called for help from the nurse and driver. Reassurance had little effect.

The following were the pertinent facts in the patient's past, family and social history: He began to drink at age 18. At first he drank only on week ends, but the amount gradually increased, and for at least two years prior to admission he drank 15 glasses of ale daily, an amount he did not consider excessive. His diet, as he described it, seemed adequate.

The patient was married in 1921. In 1928, when his alcoholism reached serious proportions, his wife divorced him and he lost his job as an accountant. He remarried in 1936, but his wife died six months later. Since that time he had been living with his mother and had been content to work as a janitor, although he lost considerable time because of his drinking.

On examination, the patient appeared somewhat frightened and upset, and he kept interrupting the interview to describe the voices mentioned above. He was fully oriented, affable, coherent and cooperative. Aside from a mild tremor of the lips and tongue, the general medical and neurological examination, as well as laboratory examination of the blood, urine and spinal fluid, revealed no significant abnormalities.

Shortly after his admission to the hospital the patient appeared calm, although he could still hear the voices "in the distance." The same afternoon, however, the voices became very clear and the patient was visibly frightened, with an apprehensive facial expression, sweating and trembling. Even after considerable reassurance he seemed convinced that the people in the adjoining rooms or corridor were about to enter and kill or harm him.

On May 19 the threatening voices disappeared, to be replaced by a soft, shallow voice, recurring only at night, coming down from the ceiling. After a few days this voice was replaced by the original voices of his neighbors, discussing the death of their child. Their voices were soft and seemed to come from behind a radiator. They did not mention the patient's name and he did not find them disturbing.

From May 19 to May 25 the patient was outwardly calm and continued to be fully oriented and rational. He still heard voices, however, although only when it was very quiet. On May 25 the voices disappeared entirely. For the ensuing day he still believed in the reality of the voices and he was puzzled at their disappearance, so that he often turned his ear to the radiator expecting to hear the voices and was surprised

to find that they were no longer there. On May 26 the patient was fully aware that the hallucinations were imaginary and he accepted our explanation that they were due to alcoholism.

Comment: This patient's hallucinations lasted for over two months, and in this respect he is representative of the small group (8 of 76 instances) characterized by hallucinations of long duration. Although in this patient the hallucinations lasted a long time in contrast to the preceding patients, we have observed other patients in whom the hallucinations lasted much longer (Cases 7 and 8). Another noteworthy feature in this case concerned the patient's behavior. Although at times the patient was calm, at other times he was agitated, the behavior in each case being appropriate to the hallucinatory content. When the voices discussed casual matters unrelated to the patient, he remained undisturbed; when the patient was implicated in the hallucinatory content, he became quite agitated.

Case 7, H.J., a 46 year old female, was admitted to the Boston City Hospital on March 6, 1952 complaining of "hearing voices" for three days.

The patient had been drinking for ten years, heavily for the last two years. Over the latter period there was an almost daily imbibition of a pint or more of gin. Beginning two weeks prior to admission she drank particularly heavily, but she stopped completely on March 1, 1952 because of nausea and tremulousness. She remained tremulous for 24 hours, and then, while trying to sleep, began to hear voices. One was the voice of an unidentified male, the other belonged to a female, whom she recognized as her neighbor. The voices accused her of being unfaithful to her husband and called her filthy names. At other times she thought that there was a car parked outside her window and that the people in the car were running the motor "just to annoy me." The voices persisted day and night for 48 hours. In an attempt to get away from them, she asked for admission to the hospital.

On examination, the patient showed a tachycardia (110 per minute) and a slight tremor about the lips. She was oriented in all spheres and she gave a consistent history as to the sequence of events preceding her admission. She was very agitated and quite inattentive. She kept insisting that the examiner stay and protect her and demanded that he call the police. At other times she would shout answers in response to the voices she was hearing.

The voices became less persistent and finally disappeared on the afternoon of March 8. During the period of hallucinations, as well as for two days after their cessation, the patient received glucose and water as the only source of food and medication. She was discharged on March 15.

Following her discharge from the hospital, the patient remained abstinent for almost four weeks. She drank heavily again from April 13–19 inclusive. On April 20 she again began to hear voices and she was readmitted to the hospital on April 24. For the next two days she had hallucinations intermittently. They were of much the same nature as on her previous hospitalization and resulted in severe agitation. On April 26 she was no longer hallucinating and appeared well composed. She remained this way and was discharged from the hospital on April 28.

Two days later, on April 30, she returned to the hospital, apparently again disturbed by voices. On this occasion, however, her behavior was different than on her previous admissions. She did have auditory hallucinations, the content of which was alternately terrifying and benevolent. On one occasion the voices accused her of being bad and sinful and threatened her with punishment; on another, they told her that "everything was all right," that "your sins have

been paid for," and this made her feel better. She thought that the voices were "trying to influence my mind" and that "they have a hex on me." At times she did not hear any voices but there was simply an exchange of ideas without words being spoken. In this way she thought that her sister's heart condition was being aggravated. She also expressed the idea that her food was poisoned. Although oriented, she would look very perplexed and would not be able to logically explain some of her actions, such as wandering off the ward. At other times she refused to speak altogether.

She remained in this state until May 8 when she was committed to a State Hospital. On March 30 it was noted that the hallucinations were clearing. On June 9 she was considered much improved and beginning July 18 she was allowed home on week ends. The improvement in her mental state was evident when interviewed on July 28. She was well oriented and could give an accurate account of her past history, of the events preceding her admission and of the activities of the ward. She stated that she was in the hospital because of "voices and fears" but these had been absent for three weeks. She remembered the content of her hallucinations; the voices said she was bad, that she was going to die and they berated her character. She thought they were real at the time and would answer them. At this interview she fully realized that they were imaginary and also that her drinking was partly to blame for her illness. She was discharged from the State Hospital in August, 1952. She was seen again in May, 1954 and her improvement had been well maintained. She had remained abstinent, was doing a full day's work and there had been no recurrence of hallucinations or other symptoms. She was voluble and her answers were intelligent and to the point. Her emotional tone was within normal range, attention was well maintained and her memory was excellent.

Comment: The patient's first two attacks of auditory hallucinations were characteristic of the acute transitory type. The hallucinations began shortly after the cessation of drinking, were very vivid and were accompanied by appropriately agitated behavior. The sensorium was clear in other respects and complete recovery from the first attack occurred while the patient was on a glucose and water diet.

With continued drinking and the recurrence of the hallucinations the nature of the illness changed, being difficult to distinguish from schizophrenia. As well as hallucinations there were also ideas of reference and influence and expressions of self-accusation and self-deprecation. At times it was difficult to follow the patient's trend of thought; her associations were vague and tangential and many of her answers were not to the point. Her thought processes were shallow and illogical. During the interview she remained for the most part quite bland, and her affective response was inadequate considering the experiences she described.

At this stage the patient showed many of the characteristics of a schizophrenic illness. There were several factors, however, which were difficult to conciliate with such a diagnosis. Firstly, her illness only developed at age 46, in close temporal relationship to heavy drinking. Secondly, in three months the patient had almost completely recovered from her illness. Finally, the patient's background and personality were not those generally regarded as characteristic of schizophrenia. She had always been a happy, outgoing person, fond of athletics and other social activities, and she was never content to be alone. She had many friends and in general had led a normal married life for 27 years.

We have observed two other patients whose illnesses were similar in many re-

spects. One of these was a chronic alcoholic bricklayer of 50 years of age, who, two days after the conclusion of a heavy drinking bout, developed vivid auditory hallucinations with an otherwise clear sensorium. His behavior was appropriate throughout and the episode ended after a week with complete recovery. Four months later, in relation to another drinking spree, he again became hallucinated. For the first week he reacted in an appropriately agitated manner. After this, however, he became quiet, despite the persistence of threatening hallucinations and in addition he expressed poorly systematized paranoid delusions. He had to be committed to the State Hospital where he remained for 3½ months. He was seen again four years later. He had remained abstinent and had returned to his previous occupation, but his mental state was unchanged from the time of his commitment to the State Hospital.

This patient was similar to Case 7 in that he suffered an attack of auditory hallucinations of the acute transitory variety before developing the schizophrenia-like illness. This raises the question whether repeated attacks of benign and transitory auditory hallucinations may render the patient vulnerable to the schizophrenic-like form of the disease. He differed from the preceding case insofar as he remained hallucinated and deluded; in this respect he was similar to the case that follows.

Case 8, W. B., a 50 year old male, was admitted to the Boston City Hospital on August 7, 1951. He was severely agitated, because voices had been threatening him for the past four days.

The patient had been a heavy drinker all of his adult life. He was accustomed to drinking whiskey and ale daily, but he continued to eat well, had not lost time from his work, nor had he suffered from any serious alcoholic illnesses in the past.

The patient drank in his usual manner through August 2. On August 3 he drank "only a little" and on August 4 he did not drink at all. Later that day he told his wife that the neighbors were going to put him in jail, because he swore at them. Also, he thought that a local bartender knew about commitment proceedings involving the patient. His wife realized that these ideas were unfounded when she questioned the neighbors. Towards evening he began to complain that there were a lot of people after him and that someone was going to take him into the cellar and beat him up. He did not sleep that night, nor for the ensuing three days prior to his admission to the hospital. During this period his face was flushed and he was very restless, jumping out of bed and pacing the floor. He kept hearing people talking about killing and beating him and he would continually turn to his wife and ask "Don't you hear them?" or say "Why don't you do something, why don't you talk to them and tell them not to beat me up." When he would sit still it was only for a moment; he would turn his head as though listening to someone and exclaim "Now they're at the door." He looked frightened and several times he ran out of the house.

The patient was admitted to the hospital on August 7. Shortly thereafter he lost his restlessness and showed only a slight tremor. He was well oriented and his account of the events preceding his admission was consistent with his wife's. His hallucinations persisted, however, and on August 11 he temporarily escaped from the ward, in an attempt to see a friend who was calling him over the microphone. Voices were still "calling me swear words." He could not identify the voices, but he believed them to be quite real. His memory remained intact and there was never any evidence of disorientation, visual hallucinations or confabulation.

The patient remained in much the same state for an entire month. On September

9, 1951 he was discharged to the State Hospital. On that day he was still hearing voices coming over the microphone in the next room. The voices were those of men whom he could not recognize, calling him dirty names and threatening to shoot him. He was disinclined to talk much and occasionally he would listen attentively to the voices. On one occasion he refused to eat his supper because he had just heard a voice through the wall informing him that he was to be shot that evening. He did not appear frightened when he related this information and with a little persuasion he ate his meal with enjoyment. He asked the examiner about a list of charges which had been brought against the patient by a barkeeper; he thought he was to be shot "on account of money" and that "Kelly" had sent me. He was convinced of the reality of his hallucinations and delusions.

At the State Hospital the patient showed little change. On October 23, 1951 electroshock therapy was instituted and in the next five weeks he received 23 treatments. By January 11, 1952 he appeared to have recovered. He was pleasant, cooperative, denied hallucinations, harbored no delusions and he was released to visit his wife. He was seen at monthly intervals thereafter and on each occasion he was described as abstinent, adjusting in a conventional manner, gainfully employed and exhibiting no psychotic manifestations.

The patient remained abstinent and symptom free until April, 1953. One evening, he was noticed to be sitting quietly by himself, speaking in a low voice: "You can't blame me for that," or "You're not going to beat me up." He acted as though he was answering questions or carrying on a conversation. Once he accused his wife of misbehavior and appeared angry, but apart from this incident he showed little emotion. He was again commited to a State Hospital and had been there for 14 months at the time of his last examination on June 4, 1954.

At that time he was pleasant and answered all the questions that were asked, although he was not spontaneously voluble. His attention was continually interrupted by voices, to which he would reply in a matter of fact manner. The voices were continuous throughout his waking hours. They belonged to four broadcasters, whose names he was not allowed to divulge. They insulted him and called him dirty names; they accused him of stealing; they told the patient that one of his relatives in Philadelphia was going to be swindled of $350,000. He also believed that the broadcasters were aware of all his movements and all his thoughts. They followed him everywhere and once they took a few shots at him. Ideas such as this evoked as little emotional display as did the most casual hallucinations.

It was difficult to follow the patient's trend of thought. His answers were not to the point and one idea followed another without any apparent connection except occasionally a clang association. For example, when asked why he was in the hospital he said: "F.E. is holding me here —she's supposed to be on the vice squad. They know everywhere I've been. There was an accident in Avon—I don't have a license." Or when asked what he thought was going to happen to him he said, "Well, in this shock treatment, I was never in the Army; they claim I was an inside man, I never carried an automatic, you know the Automat in New York." He was completely lacking in insight and in contrast to the first episode of hallucinosis his memory for recent events was inaccurate. There were no abnormal neurological signs.

Comment: This case is presented in considerable detail because it is unique in many respects. In the beginning, the hallucinosis was in no way different from the usual acute transitory form; it occurred after the cessation of prolonged drinking, and it was characterized by vivid hallucinations and an appropriate reaction on the

part of the patient. Following the initial period of fright and agitation the patient became quiet and resigned. This change in behavior occurred despite the fact that the content of the hallucinations remained threatening and derogatory. The hallucinations and delusions then persisted for five months and the patient made what appeared to be a complete recovery. This recovery was maintained for over two years, during which time the patient was completely abstinent. Then there followed the spontaneous development of an hallucinatory illness which had lasted for 14 months when last seen. The last illness was characterized by illogical thinking, vagueness, tangenital associations and a dissociation of affect and thought content—in short, the symptoms of schizophrenia. Yet there were features which are unusual for schizophrenia. In our patient the hallucinations were very vivid and continuous; they persisted all day long and interrupted the examination for minutes on end; it was at times impossible to gain the patient's attention while he was hallucinating. Furthermore, the patient was actually in good contact and not aloof; there was a diffuse quality to his awareness rather than a restriction of awareness as one finds in schizophrenia. Finally the patient's age, his prepsychotic personality and the close temporal relationship to drinking, would all favor an alcoholic rather than a schizophrenic process.

The development of a schizophrenic-like illness in an alcoholic patient is a situation that must be clearly distinguished from schizophrenia complicated by an acute alcoholic episode. We encountered three patients of the latter type in the present series and have seen several others since. In these patients the symptoms of schizophrenia antedated the alcoholism; the hallucinations related to alcoholism were transitory, and when they ceased the patient was able to recall them and to realize their imaginary nature; with the subsidence of the alcoholic illness, the patient was left with the symptoms of schizophrenia, into which he had no insight.

V. COMMENT

THE CLINICAL FEATURES OF ALCOHOLIC AUDITORY HALLUCINOSIS

From the data presented in the preceding section it is evident that an illness, in which the occurence of auditory hallucinations is the outstanding feature, may take several forms.

a) Most frequently it takes the form of a benign illness, lasting a few hours or days, characterized by vivid vocal hallucinations in an otherwise clear sensorium, by aberrations in behavior appropriate to the hallucinatory content and by a restoration of insight concomitant with or shortly following the cessation of the hallucinations. Although the auditory hallucinations and the associated disturbances of behavior may be the sole manifestations of this illness, other signs of prolonged inebriation and abstinence are usual, such as tremulousness, transient visual hallucinations and seizures. Occasionally such a state may evolve into a full-blown delirium tremens.

b) Much less frequently the hallucinations may persist for several weeks or even months, but the illness in general retains the characteristics of the more transient form.

c) An illness, which in the beginning is indistinguishable from the transitory type depicted above, may become altered in symptomatology and greatly prolonged in duration. The transition can be recognized after a short period of time, as early as one week. The patient becomes quiet and resigned, despite the fact that the hallucinations may remain threatening and derogatory. Ideas of reference and influence and other poorly systematized paranoid delusions become prominent. Examined at this stage, the patients show the characteristic symptoms of schizophrenia—vague

and illogical thinking, tangenital associations and a dissociation of affect and of thought content. There is some evidence from the data (in 2 out of 4 cases) that repeated attacks of acute auditory hallucinosis render the patient vulnerable to the development of this chronic form of illness. This feature was also noted by Wolfensberger (30); in 16 of his patients with alcoholic hallucinosis, 4 had repeated attacks and these cases "later went over into schizophrenia."

In delineating these types of alcoholic auditory hallucinosis, our data are in essential agreement with those of Benedetti (2). This author analysed 113 cases of alcoholic hallucinosis. In all instances the illness began acutely. Ninety cases recovered within 6 months. The remaining patients, which he terms the chronic group, were of two types: (a) the schizophrenic type (13 cases) and (b) the organic dementia type (10 cases). Benedetti's experience with the schizophrenic type was very much the same as our own: "the schizophrenic group ... usually occur in conjunction with the acute hallucinatory episode. A few weeks to months after entering the institution there developed obliquity of thinking, classical schizophrenic mood disturbances and grandiose delusions."

In contrast to the schizophrenic type, Benedetti describes a chronic alcoholic hallucinosis characterized by disturbances of intellectual function, with loss of ideas and of critical faculties. The physical examination of these patients showed peripheral neuritis, liver disease, ataxic disorders and so forth, while at autopsy "brain atrophy and arteriosclerosis were often found. It is noteworthy that the interval between the appearance of the acute hallucinosis and the chronic psychosis ranged from 3.8 to 15 years, and that the patients had frequently continued to drink in the interval. It is doubtful whether this dementia should be classified as a type of hallucinosis. An examination of the alcoholic population in a State Hospital would lead us to believe that a chronic dementing illness of the sort described, accompanied by signs of liver and peripheral nerve disease may indeed occur in patients with a background of prolonged and excessive drinking. However, its connection with auditory hallucinosis is no more characteristic than its connection with delirium tremens, or other manifestations of the abstinence syndrome.

THE RELATIONSHIP OF ALCOHOLIC AUDITORY HALLUCINOSIS TO SCHIZOPHRENIA

The unique feature of alcoholic auditory hallucinosis and the one which separates it sharply from other alcoholic diseases, is its relation to schizophrenia. The nature of this relationship has been a point of contention from the time of the earliest writings on this subject, and practically every article debates the question of whether the hallucinoses "belong" to the exogenous (alcoholic or to the endogenous (schizophrenic) illnesses.

Some comments on this relationship, as it was discerned in our patients, have already been made (see Cases 7 and 8). Our observations on this matter may be summarized as follows:

a) In the benign, transient form of auditory hallucinosis, which occurred in 68 of 76 instances, there was no significant relationship to schizophrenia. The past history of these patients did not disclose any symptoms of schizophrenia, with 3 exceptions. These three patients did indeed have schizophrenia; they also drank excessively, in association with which they developed a transient episode of auditory hallucinosis. On recovery from the alcoholic illness, the signs of schizophrenia persisted. The personality type of these 68 patients was predominantly cyclothymic or extroverted. The hallucinatory illness was benign and transitory and was causally related to the alcohol itself.

b) In the chronic form of auditory hallucinosis, which occurred in 8 of 76 in-

stances, a similarity to schizophrenia was found in four patients. The symptomatology of the schizophrenic-like illness has been indicated; it could not be clinically distinguished from schizophrenia. There were several points of difference, however, between these four patients and those with "classic" schizophrenia. In the former group, the symptoms began at 46 to 50 years of age, a range considerably beyond that usually encountered in schizophrenia. The past history of these patients revealed no evidence of schizophrenic symptomatology. The personality types were "cyclothymic" rather than schizothymic.

It can be logically concluded from these observations that (1) a syndrome which is clinically indistinguishable from schizophrenia may emerge in relation to prolonged and excessive intake of alcohol and (2) the patients with this syndrome, prior to its appearance, could not be considered schizophrenics.

In regard to both the transitory and the chronic form of alcoholic auditory hallucinosis our observations agree closely with those of Benedetti (2) and of Harder (7). On the basis of the family background, body build, pre-psychotic personality, symptomatology and final clinical picture of 90 patients with the transitory form of the disease, Benedetti found no connection with schizophrenia. In regard to the schizophrenic type of alcoholic hallucinosis, he pointed out that the age of onset and the family background were quite unlike that of "classic" schizophrenia. The observations of Harder (7) who studied 9 patients with the chronic form of alcoholic hallucinosis, are similar. He found that all his patients were of the "pyknic" type and that six of the nine were "syntones;" the family history of schizophrenia was lacking; and there was a close temporal relationship between the onset of hallucinations and a bout of drinking.

Harder (7) concludes that a latent predisposition to schizophrenia has a formative effect on this illness, which in turn is then made manifest by an exogenous ("alcoholic") factor. These conclusions do not appear to derive from his own observations. Furthermore, the validity of the entire concept, which is constantly repeated in the literature, is open to serious criticism. It is questionable whether there is an entity which can be identified as latent schizophrenia, with sufficiently characteristic features to be distinguished from schizophrenia itself. Even if one assumes that latent schizophrenia is an entity, there is no evidence that it had been present in the patients who later developed the schizophrenic-like illness due to alcoholism. In terms of age, sex, personality, alcoholic habits and mode of onset of the hallucinations, we were unable to discern any difference between the patients who developed the schizophrenic-like illness and those who did not. The diagnosis of latent schizophrenia is frequently made in retrospect, the latency of the disease process being inferred from the fact that it eventually became manifest. Used in this manner the term "latent schizophrenia" is a meaningless concept.

Alcoholism and schizophrenia may be related in yet another way, a fact which may account for some of the confusion on the subject. There are patients with schizophrenia who develop alcoholic hallucinosis, the symptoms of schizophrenia clearly antedating their alcoholism. Attention has been drawn to 3 such patients that came under our observation, despite the statement by Huber (9), that "alcoholic hallucinosis never occurs in the course of an already apparent schizophrenia."

THE ETIOLOGY OF AUDITORY HALLUCINOSIS

A large number of theories concerning the etiology of auditory hallucinosis have been proposed. The hypothesis which links alcoholic hallucinosis to schizophrenia has been discussed. Equally popular has been the theory incriminating the toxic effect of

alcohol, a view which is reflected in the frequent references to alcoholic auditory hallucinosis as one of the "toxic psychoses." There are a number of objections to such an idea. It is illogical to incriminate alcohol itself as the responsible toxin when it may actually nullify the hallucinations (as, for example, in our Cases 2 and 3). In one of our patients the hallucinations subsided over a period of 3—4 days, while the patient was being fed small doses of whiskey. It is manifestly difficult to explain how disturbances supposedly caused by alcohol are removed by alcohol. This is not to deny the importance of alcohol in the production of auditory hallucinosis. However, its mode of action does not appear to be a direct toxic one, but is rather related to prolonged inebriation and ultimate abstinence, a theme which will be developed in the next section.

In recent years, claims have been made regarding a specific metabolic defect in the production of delirium tremens and its variants (25, 26). In our experience, ACTH or adrenal cortical extracts have not altered the course of recovery in these patients in any way that could not be accounted for by the natural history of the illness. Our observations on patients with auditory hallucinosis or other alcoholic illnesses who were treated with ACTH and cortisone would not allow us to conclude that there was an acute or chronic deficiency of these substances.

Although dietary aberrations were frequently encountered in our patients, nutritional factors do not seem to be important in the production of the hallucinations. Some of our patients developed auditory hallucinosis despite an adequate diet. As a corollary, an uneventful recovery occurred in 3 patients who were denied food and who were given water alone, and in 6 patients who were given only water and glucose throughout the course of their illness. The feeding of glucose alone should theoretically have increased the patient's need for thiamine.

In the Introduction, reference has been made to the idea that the personality type is the determining factor in the type of alcoholic psychosis. Kretschmer originated the popular belief that the schizothymic (introverted) type develops hallucinosis, whereas the cyclothymic (extroverted) type develops delirium tremens. Kretschmer's views are open to criticism for several reasons. Using Kretschmer's criteria only an occasional patient in our series could be classified as schizothymic. The occurrence of different alcoholic illnesses in the same patient (*e.g.*, auditory hallucinosis and delirium tremens) would be incompatible with Kretschmer's theory. Finally, it appears that delirium tremens and auditory hallucinosis are fundamentally similar, insofar as the same factors are operative in their genesis. This point is elaborated below.

THE ROLE OF PROLONGED INEBRIATION AND OF ABSTINENCE IN THE GENESIS OF ALCOHOLIC AUDITORY HALLUCINOSIS

In the genesis of auditory hallucinations, two factors are of particular importance, (1) prolonged intoxication with alcohol and (2) ultimate withdrawal from alcohol. The data bearing on these factors have been presented in detail in the section on Observations (Tables 8 and 12, Fig. 1). It was pointed out that although prolonged inebriety was the common denominator in all our patients, the hallucinations rarely occurred during the period of active drinking.

Judging by the patients' statements, the hallucinations apparently had their onset while drinking in 15 of 76 instances. At first glance, this observation might be construed as evidence against the idea that withdrawal from alcohol was of etiologic importance. However, this observation requires qualification in several ways. To begin with, it does not take into account

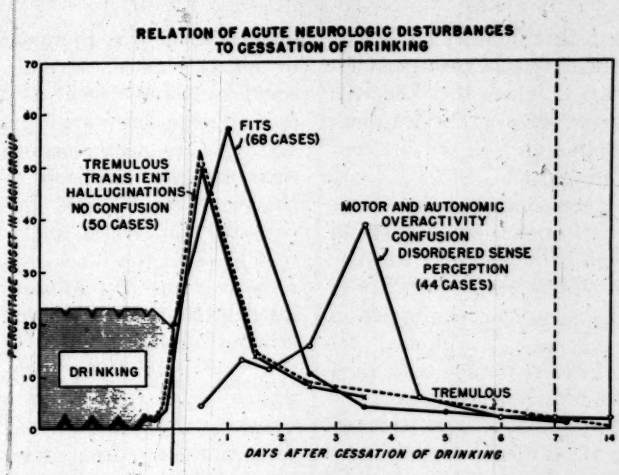

Fig. 2: Relation of Acute Neurologic Disturbances to Cessation of Drinking.

the role of *relative abstinence*. This factor could not be assessed accurately from the patient's history. Nevertheless, all of these patients developed their hallucinations toward the end of a protracted spree, and three patients insisted that they had been "tapering off" for several days before withdrawal. In others (*e.g.* Cases 2 and 3), the voices were nullified by taking a drink, only to recur when the effects of the whiskey had again worn off. For purposes of tabulation, the hallucinations in these patients were regarded as having their onset while the patient was drinking; it would be more accurate to speak of this group as continuing to drink despite their hallucinations.

Previous work has shown that a relation exists between other alcoholic illnesses, such as tremulousness, transient visual hallucinations, seizures and delirium tremens and the relative or absolute withdrawal from alcohol (27). This relationship is illustrated in Figure 2. A number of other features can be discerned from this figure. There appears to be a definite time relationship between the syndromes themselves, full-blown delirium tremens always following the states of convulsions and transient hallucinations. If one compares Figure 1 and 2, it will be seen that auditory hallucinations have much the same relation to the cessation of drinking as do tremor, transient visual hallucinations and seizures.

The abstinence theory is further supported by evidence derived from studies in experimental barbiturate and alcohol addiction carried out by Isbell and his associates (10, 11). When human volunteers were given large doses of barbiturates for 92–144 days, the characteristic signs of drunkenness or intoxication were produced. After the abrupt withdrawal of the drug the signs of drunkenness rapidly disappeared, and were replaced by tremor, hallucinations, seizures and full-blown delirium tremens, in this general sequence. More recently these authors have duplicated this pattern of events with alcohol. In six patients who were abruptly withdrawn from alcohol after 48 to 87 days of intoxication, the characteristic syndrome of tremor, transient visual and auditory hallucinations, convulsions and delirum occurred. Wikler (29) has kindly provided us with the detailed protocols of this experiment. In 2 patients, on the second and fourth day of abstinence respectively,

there occurred transient auditory hallucinations. The characteristics of these hallucinations and setting in which they occurred were very much the same as the transient auditory hallucinations which we observed in our patients.

In summary, it would appear from these observations as well as our own that tremulousness, transient hallucinations, fits and delirium are a closely related group of symptoms. Any patient may show one or a combination of these symptoms; the mildest degree of the syndrome may show itself only after a few days of drinking and after a relatively short period of abstinence; the more severe forms of the syndrome require a long background of imbibition, and only become manifest after several days of abstinence.

A few other points require brief comment. This study does not throw any light on the anatomy of auditory hallucinosis and the few post-mortem studies have disclosed no significant gross or microscopic changes in the brain. Routine biochemical studies of the blood and electroencephalograms have been similarly unrevealing. It is of some practical importance that these patients can usually be managed on the medical wards of a general hospital. The usual course is of such short duration that commitment to a mental hospital, and the prolonged hospitalization that frequently follows such an action, is unnecessary. The short natural history of auditory hallucinosis and other manifestations of the abstinence syndrome should also be emphasized in relation to the extravagant claims that are being made regarding the therapeutic efficacy of various drugs.

VI. SUMMARY

1. The phenomenon of auditory hallucinations in chronic alcoholism has been studied. Clinical observations of 76 instances of this illness are recorded and illustrative case histories are presented.

2. Although the occurrence of auditory hallucinations was the outstanding feature in all the cases, several clinical forms could be distinguished: a) In 68 instances the hallucinations were benign and transient and were frequently associated with other signs of prolonged inebriation and abstinence; b) in 8 cases the hallucinations persisted for several weeks or months; c) in 4 of these the illness was indistinguishable from the first type at its outset, but later the characteristic symptoms of schizophrenia developed.

3. Our observations indicate that a syndrome may emerge in relationship to excessive drinking which is clinically indistinguishable from schizophrenia. The patients with this syndrome, prior to its appearance, could not be considered schizophrenics and the age of onset was later than that usually encountered in schizophrenia. The concept, that the schizophrenic-like illness is simply "latent schizophrenia made manifest by alcohol" is neither logical nor consistent with the observed facts.

4. The current theories concerning the etiology of auditory hallucinosis are critically evaluated. Data are presented to show that the development of auditory hallucinations depends not only on the effect of prolonged inebriation, but ultimately on the effect of withdrawal of alcohol. The factor or factors responsible for the prolongation of the illness and for the occasional transition to a schizophrenic-like form, are unknown.

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BRIEF COMMUNICATION

HYPOCHONDRIASIS: A REEVALUATION

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Few situations are more familiar to the practising physician than that of the patient who suffers from preoccupation with bodily complaints with little or no demonstrable organic pathology. The term "hypochondriac" has become an integral part of the clinical vocabulary. Laughlin defines this condition as " . . . a state in which there is a more or less persistent anxious over-concern about the state of health or the possible presence of illness" (3, p. 497). He states that a fundamental facet of this condition is the extreme discrepancy between the degree of organic pathology and the amount of concern and interest exhibited by the patient.

Although hypochondriasis is most frequently thought of as a neurotic entity many authors have indicated that this symptom complex may often foreshadow a more malignant psychiatric disease. Noyes (7) notes that the manifest symptoms of psychotic depression are frequently preceded by hypochondriacal trends. Masserman has pointed out that "When this introspective preoccupation and narcissistic self-concern reaches the point of exclusion of all other interests the 'hypochondriac' process may, indeed, transcend the limits of neurosis and become psychotic in the sense of autistic isolation, delusional preoccupations and schizoid retreat" (4, p. 52). More recently Miller (6) in discussing the importance of diagnosis in medical and surgical practice of the borderline psychotic patient stresses the fact that these marginally adjusted patients are often particularly concerned about their bodies with the somatic outlet being an expression of the emotional illness.

The relationship between hypochondriasis and dependent needs has been outlined by Aldrich (1) and, if not explicitly stated, this relationship has been implicit in the explanatory thinking of many. It is, of course, natural that the physician speculates about patients who actually come to him rather than those who do not. The consequence of this is the popular tendency to correlate hypochondriasis, or over–concern with bodily well–being, with increased dependence on the doctor. It is frequently inferred that this increased dependence is equated with an increased demand on the physician's services.

It is probably true that among those patients who make inordinate claims upon the practitioner's time there are a large number of hypochondriacs. However, to reason that since this is true it then follows that all hypochondriacs see doctors more frequently is a non sequitur. The impetus for the present study grew out of the recognition of this logical fallacy, and the question which followed was whether the assertion that hypochondriacs see doctors more frequently than non–hypochondriacs is indeed fact or whether it is one of those "truths" which are held to be self-evident without need of verification.

Thus the task of the present research was to subject this problem to rigorous controlled study with the formulation of a null hypothesis that no differences exist between hypochondriacs and non–hypochondriacs in the frequency of clinic visits during an extended time span.

METHOD

The routine administration of the Minnesota Multiphasic Personality Inventory to all students entering the University of Wisconsin during a several year period plus the availability of free medical services to all en-

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rolled students provided a unique opportunity to study this problem. Much has been written about the MMPI and there would be no need to discuss this psychological test in the present context. The interested reader is referred to some of the recent literature wherein the test is discussed in some detail (2, 8). The present study was concerned with this instrument not as a personality inventory *per se* but specifically in terms of the Hypochondriasis Scale which is only one of many dimensions of the test. This scale consists of 33 statements relating to bodily complaint and concern. Each student indicated whether the statement was true or false as it applied to him. Sample statements: "I am very seldom troubled by constipation", "I am bothered by acid stomach several times a week", "I hardly ever feel pain in the back of my neck", "I seldom or never have dizzy spells", etc. Perusal of the statements reveals that the scale covers most of the more frequently encountered complaints offered by hypochondriacal patients.

The applicability of this measure to a study involving a university population is apparent in the fact that in the original standardization, 265 college students were employed. The standards for inclusion of a question were quite rigorous: an item was included only if it showed a percentage frequency difference between normals and the clinical group which was at least twice its standard error. Most of the items exceeded even this rigorous requirement (5). There is no question then that the complainers are more hypochondriacal than the non–complainers. Since student clinic services are free, the question of ability to pay was eliminated and the fact that students were enrolled for a four year college course provided an opportunity for follow–up over this period of time.

The original pool of subjects consisted of over a thousand male undergraduate university students who were selected randomly. From this group 150 students who had over fifteen complaints and 150 with fewer than ten complaints were selected for follow–up investigation. The number of clinic visits for each group was computed and tests of statistical significance were performed to determine the presence of any real difference in total number of clinic visits between the groups.

RESULTS

The mean number of clinic visits of the high complaint group was 7.78 and for the low complaint group, 7.34. A critical ratio was computed for the significance of the difference between these means and the null hypothesis could not be rejected at even the 25% level of confidence; clearly, no significant difference existed between these groups. Additionally, a comparison of the means among the four years for the two groups failed to establish the presence of any significant trends from one year to the next.

This latter point was especially significant in that it permitted us to ensure that we were not overlooking the possibility that hypochondriacs who are not satisfied with clinic services might be seeking the services of local private practitioners. If that were so we would expect a sharp fall in the number of visits as compared to the early semesters. Since no such fall in the incidence of clinic visits was found, the possibility of desertion to private care was therefore eliminated as a possible attenuating factor.

DISCUSSION

Assuming that this finding can be validly generalized to a broader population, what are its implications?

If, as Aldrich states, complaining is in the service of gratifying dependent needs, these needs are apparently not being fulfilled by the physician. The possibility remains that complaining in other relationships sufficiently gratifies dependent needs so as to make reliance on the physician unnecessary. Although data bearing on this possibility are not available, we are inclined to question whether strong dependent needs or any other

single variable characterizes the whole population of complainers, because of our present findings and because of clinical experience.

We have been impressed, for example, by the fact that many persons referred to psychiatrists as hypochondriacs have in fact been phobics suffering, in part, from somatic phobias. Rather than serving the interpersonal role of dependent gratification, the complaining here serves a largely *intra*personal defensive role, protecting the complainer from experiencing emotions which he cannot acknowledge as a part of himself. Complaining then, may be more important in determining how the patient views himself than in how others, including physicians, may react to him.

Clinicians frequently refer another group with a label of hypochondriasis. Bodily complaints which are predominantly the physiological expressions of free-floating anxiety principally characterize this group. The suspicion that such a group contributes to the heterogeneity of our patients (and probably to all those labelled hypochondriacs) is heightened by perusal of the hypochondriacal scale. Many of the items can clearly be interpreted as anxiety referents. Anxiety of very great degree may, as noted earlier, be manifested by bodily complaints of a bizarre character and which portend psychosis. Here the bodily complaint also seems to have a descriptive role, expressing for the patient his terrifying subjective experience of "flying into pieces."

We believe that this study, with the clinical considerations cited, lends further support to the already prevalent psychiatric clinical opinion that a large number of bodily complaints does not, of itself, define a useful syndrome. Accordingly, we believe the decision to drop this ambiguous term from the nomenclature was wise.

SUMMARY

Two groups, one with numerous bodily complaints, the other with few, (as judged by the MMPI Hypochondriasis Scale) have been compared statistically with respect to the frequency of medical clinic visits. No significant difference was found. This finding is discussed in its implications for the concept of hypochondriasis, the authors believing that it lends support to the opinion that complaining, *per se*, does not define a group with common pathology.

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BRIEF COMMUNICATION

E.C.T. AS A LIFE SAVING MEASURE

WILLIAM D. WHEAT, M.D.[1]

Contraindications to the use of electroconvulsive treatments because of organic conditions have steadily diminished over the years as clinical experience has accumulated and medical treatment measures have improved. The more liberal use of electroconvulsive therapy in those patients who might benefit has apparently been justified since the number of fatalities attributed to these treatments is very small. Although there are no complete data available on E.C.T. mortality the estimate of 0.06 percent is made from reported figures (2, 5). Most of the cases reported in which there is apparent some relation between treatment and death are cardiovascular in origin with occasional reports of respiratory failure, uremia, cerebral damage, fat embolus to the brain, or severe pre–existing pathological changes in the brain.

Patients with cardiac pathology have been considered the most frequent serious treatment risk encountered although in recent years reports have been made of patients with heart disease, including patients who had undergone cardiac surgery for relief of chronic mitral stenosis, who have tolerated electroconvulsive treatments without complications (3, 4). More than 50 percent of the reported fatalities have occurred after the first treatment and most of these have been attributed to the inability of an impaired cardio–respiratory system to withstand a convulsion (1).

The case reported below is intended to illustrate how E.C.T. was literally a dramatic life saving procedure. The treatments were administered with the consideration that there was serious organic pathology; the treatments were a last resort and a grave risk, but the clinical situation seemed to offer no choice.

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CASE REPORT

The patient was a 54 year old married salesman who was admitted to the Henry Phipps Psychiatric Clinic for the first time in November of 1952 because of a three week period during which he became progressively more agitated, lost interest in his surroundings, began to brood and have crying episodes, and became increasingly preoccupied with delusional ideas that he had a skin condition caused by a malignant venereal disease which was destroying him and everyone around him, particularly his wife. He stopped work completely a week prior to admission, stopped eating, was unable to sleep, and became obsessed with the idea that he should be "put away" or be killed for his sins of past sexual indiscretions which had led to an incurable venereal disease with which he was infecting everyone.

Significant history revealed the patient was a self–contained, rigidly obsessive, dependent man who was always steady, reliable, and conservative in habits and judgment. He had been bothered periodically since 1935 by a chronic skin eruption of the groin and abdomen which had been variously diagnosed as eczema, seborrheic dermatitis, and neurodermatitis. For many years he had a chronic cough and shortness of breath with periodic asthmatic symptoms, and in 1946 the diagnosis of chronic bronchiectasis with emphysema was made. The respiratory condition became more disabling over the years.

On admission he was an agitated, delusional man appearing weak and fatigued.

There was evidence of dyspnea, barrel-shaped chest, marked limitation of chest movement, coarse sibilant and wheezing râles over both lung fields, and mottled, thickened, scaly skin over the lower abdomen and groin. Chest X-ray revealed markings consistent with emphysema, asthma and bronchiectasis. Electrocardiogram showed abnormal T waves and changes "consistent with emphysema". There was a moderate leucocytosis.

The patient showed a rather marked favorable response to hospitalization during the first three weeks, and although E.C.T. had been considered it was withheld because of the clinical improvement as well as the chronic respiratory disease. Gradually the patient's delusional ideation disappeared; he began to take a renewed interest in his life although he continued to magnify the significance of the neurodermatitis. Psychotherapeutic intervention was thought to have been effective only in rendering support to the patient as his depressive symptoms diminished, as he resisted throughout hospitalization any consideration of issues and conflicts in his attitudes and life situation.

He was discharged from the clinic with the diagnoses of (1) psychotic depressive reaction, severe, much improved and (2) chronic bronchiectasis, emphysema and asthmatic bronchitis.

He was admitted for the second time in August of 1953 because of the presence of psychotic depressive symptoms over the preceding three week period. His mental status was similar to that of the first admission. During the six month interval between hospitalizations his physical condition had remained stable, but respiratory symptoms began to increase as his depressive symptoms increased in severity.

Psychiatric examination showed an extremely agitated, depressed man who was completely preoccupied with self-deprecatory delusions relating to his skin disease. He wanted to die, felt that he deserved to die, and became disturbed anytime he was approached because of his delusional idea that he was infecting everyone with a virulent venereal disease. His physical status was poor and seemed to deteriorate as his agitation continued. He was dyspneic, wheezing, had a low-grade fever, and showed cyanosis of his lips and nails. He refused nourishment and required tube feedings. Sedation with barbiturates was limited because of his precarious respiratory status.

With the concurrence of the medical consultant, antibiotics, antihistamines, sympathomimetic drugs, sedation and tube feedings were given as needed, but the patient's clinical condition did not improve. One week after admission there was evidence of cor pulmonale, and the patient was digitalized. His cardiac and respiratory decompensation seemed to grow worse; the agitated depressive symptoms remained unchanged, and the patient was placed on the critically ill list.

Even though the risks were great, the decision was made to administer E.C.T. as there seemed to be no other therapeutic procedure which might reverse the progressively deteriorating effect of the agitated depression and the cardio-respiratory decompensation which seemed to be operating synergistically.

A period of apnea followed the first two treatments, and the patient was resuscitated with positive pressure oxygen and intravenous coramine. After the third treatment a marked improvement was noted in his mental and physical status. The signs of respiratory and cardiac decompensation quickly disappeared as did his psychotic thinking and depressed mood. A course of seven E.C.T. was given without incident, and the patient left the hospital markedly improved three weeks after the last treatment. It was evident that the improvement had been only symptomatic, and it was predicted that he would have recurrent depressive reactions.

In the three and a half years since his

second admission he has had two depressive episodes which have required brief periods of hospitalization, and electroconvulsive treatments have been administered without incident even though his physical condition has been chronically poor. He has not suffered further episodes of severe cardio–respiratory decompensation as in the second admission to the hospital. Between depressive episodes the patient has been able to adjust comfortably at home although his chronic respiratory disease limits his physical and work activities.

SUMMARY

A case of a severe psychotic depressive reaction in an individual with marked cardio–respiratory decompensation (chronic bronchiectasis and emphysema with cor pulmonale) successfully treated symptomatically with electroconvulsive treatment is described. The case illustrates how an agitated depressive state and a severe physical disability can conspire to enhance the total ill–effect on the individual, yet making therapeutic intervention with E.C.T. a possible life saving measure even though a hazardous risk. It seems unlikely that this patient would have survived if the risk in treatment had not been taken and is an indication of the general safety as well as effectiveness of one of the most valuable treatment methods in psychiatry.

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BRIEF COMMUNICATION

D. H. LAWRENCE'S "THE FOX" AND THE PSYCHOANALYTIC THEORY ON LESBIANISM

EDMUND BERGLER M. D.[1]

In his comparatively obscure novelette called "The Fox", D. H. Lawrence told the story of two half-intellectual Lesbians living on a farm in England at the end of the first World War. They are trying, unsuccessfully, to raise chickens; their main obstacles are a fox which repeatedly raids the barnyard, a number of strange illnesses, and their flock's "obstinate refusal to lay eggs." The fox gradually becomes the most serious of their problems. The women plan to shoot him, but he is too elusive for them. At length one of the women, March, comes face to face with the fox:

> She lowered her eyes and suddenly saw the fox. He was looking up at her. His chin was pressed down, and his eyes were looking up. They met her eyes. And he knew her. She was spell-bound—she knew he knew her. So he looked into her eyes, and her soul failed her. He knew her, he was not daunted . . . . She struggled, confusedly she came to herself, and saw him making off, with slow leaps over some fallen boughs, slow, impudent jumps . . . (Later) she took her gun again and went to look for the fox. For he had lifted his eyes upon her, and his knowing look seemed to have entered her brain. She did not so much think of him: she was possessed by him. She saw his dark, shrewd, unabashed eye looking into her, knowing her. She felt him invisibly master her spirit . . . And again, she saw him glance over his shoulder at her, half-inviting, half-contemptuous and cunning . . . .

The fox invades March's reveries:

> March also was not conscious that she thought of the fox. But whenever she fell into her half-musing, when she was half-rapt and half-intelligently aware of what passed under her vision, then it was the fox which somehow dominated her unconscious, possessed the blank half of her musing. And so it was for weeks, and months.

A young soldier then comes to the farm. The two women find out that he is the grandson of the previous owner, and had not known of his grandfather's death; he had enlisted in Canada. Lawrence describes March's reaction to the stranger in these terms:

> The young man—or youth, for he would not be more than twenty—now advanced and stood in the inner doorway. March, already under the influence of his strange, soft, modulated voice, stared at him spell-bound. He had a ruddy, roundish face, with fairish hair, rather long, flattened to his forehead with sweat. His eyes were blue, and very bright and sharp. On his cheeks, on the fresh ruddy skin, were fine, fair hairs, like a down, but sharper. It gave him a slightly glistening look . . . . But for March he was the fox. Whether it was the thrusting forward of his head, or the glisten of fine whitish hair on the ruddy cheek-bones, or the bright, keen eyes, that can never be said: but the boy was to her the fox, and she could not see him otherwise.

The young man spends his leave at the farm, and falls in love with March. For some time, he cannot make out the relationship of the two young women: March acts the "man", and Banford, her companion, the "wife". Confronted with the boy's advances, March is quite helpless and evasively confused. Then the young man shoots the fox:

> The first thing that both she and Banford did in the morning was to go out to see the (dead) fox. It was a lovely dog-fox in his prime, with a handsome thick winter coat: a lovely golden-rod colour, with grey as it passed to the belly, and belly all white, and a great full brush with a delicate black and grey and pure white tip . . . . "He's a beauty, isn't he?" said Henry, standing by.—"Oh, yes, he's a fine big fox. I wonder how many chickens he's responsible for," she replied . . . . "Are you going to skin him?" she asked.—"Yes, when I've had breakfast and got a board to peg him on." . . . "My word, what a strong smell he's got! Pooo! It'll take some washing off one's hands. I don't know why I was so silly as to handle him."–And she looked at her right hand, that had passed down his belly and along his tail,

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and had even got a tiny streak of blood from one dark place in his fur.—"Have you seen the chickens when they smell him, how frightened they are?" he said.—"Yes, aren't they!" Later in the day she saw the fox's skin nailed flat on a board, as if crucified. It gave her an uneasy feeling.

At last March consents to marry Henry, but subsequently changes her mind again and again. Severe conflicts with Banford, her Lesbian friend, follow. Here is one scene involving the women:

He heard Banford's fretful: "Why don't you let me help you with the parcel?" She had a queer plaintive hitch in her voice. Then came March's robust and reckless: "Oh, I can manage. Don't you bother about me. You've all you can do to get yourself over."—"Yes, that's all very well," said Banford fretfully. "You say 'Don't bother about me' and then all the while you feel injured because nobody thinks of you." . . . "When do I feel injured?" said March.—"Always. You always feel injured. Now you're feeling injured because I won't have that boy to come and live on the farm."—"I'm not feeling injured at all," said March.—"I know you are. When he's gone you'll sulk over it . . . ."

In addition to "feeling injured," March enjoys the conflict between Banford and the young man:

March seemed to flourish in this atmosphere. She seemed to sit between the two antagonists with a little wicked smile on her face, enjoying herself. There was even a sort of complacency in the way she laboriously crocheted, this evening.

The end of the story is that the young man "inadvertently" kills his Lesbian competitor while felling a tree ("No one saw what was happening besides himself"); March marries the young man, although the marriage does not seem to work out sexually because March still cannot accept her new passive role.

"The Fox" contains a series of observations and between–the–lines allusions which are clinically correct. Mingled with these are inaccuracies, but the clinically correct observations predominate.

1. Lawrence describes the typical husband–wife camouflage of Lesbians, and at the same time stresses the psychic–masochistic substructure of the camouflage. March places her masochism in fantasies, remains helpless against the "mocking" fox although she has a shotgun in her hands, is equally masochistic in her relationship with the young man after he has shot the fox.

2. Lawrence correctly describes March's constant "injustice collecting," hence her hidden psychic masochism. Banford's specific reference to this, "You always feel injured", is quoted above.

3. Lawrence accurately depicts the two sets of identification in March: the "leading" masochistic identification with the victim, and the "misleading" masculine identification, deposited in the Oedipal camouflage of her relationship with Banford.

4. Lawrence ingeniously hints that the fox, the devourer of chickens, symbolizes the "devouring" mother; we know that the fear of being devoured has priority in the "septet of baby fears."

5. With a combination of naivete (on a conscious level) and good intuition (on the unconscious level), Lawrence describes the unvarying inner defense of his masochistic heroine: the search for love, which these sick women can find neither in the Lesbian nor in the connubial bed since "injustice collecting" is the real aim.

6. Finally, Lawrence presents with clinical correctness the defensive pseudo–aggression so predominant in Lesbians. March speaks harshly to Banford, enjoys the conflict between Banford and her male competitor, and even marries the man who has been directly or indirectly responsible for Banford's death. Moreover, in some "tender" manner, she is glad of the fox's death.

Lawrence's accurate observations outweigh in importance his cherished mystical ideas on sex–predominance, which are brought in at the end of the story when he explains March's frigidity in terms of the superficial defensive masculine camouflage. Lawrence also misunderstands March's reason for turning to the young man: he declares that March identified the fox with the young man ("The boy was to her the fox"), and

claims that March had been helpless against the fox. Putting the two statements together, one sees that March lands exactly at the point she tried desperately to escape—the point of masochistic passivity on the part of the victim (the devoured "chicken").

The initial analytic theory on Lesbianism assumed that a specific elaboration of an Oedipal situation was involved. In 1927, Ernest Jones suggested that Lesbianism could be traced to two factors: "an unusually intensive oral eroticism and an unusually strong sadism." In 1931, in his study "On Female Sexuality", Freud described the pre–Oedipal phase of the girl. Freud assumed that basically this attachment is shattered through ambivalence and hate. In application of these ideas, H. Deutsch reported in 1932, in her study "On Female Homosexuality", that her Lesbian patients repeated the child–mother and not the Oedipal fixation in their perversion: should the hatred for the pre–Oedipal mother be too pronounced, the reactive feeling of guilt gives rise to an attempt to deny its contents, according to the formula: "I'm not the refused and rejected child; I'm a child loved and nourished by you."

In a series of papers on Lesbianism, summarized in my books, *Neurotic Counterfeit–Sex*" (1951), *Kinsey's Myth of Female Sexuality* (in collaboration with W. Kroger, 1954), and *Homosexuality: Disease or Way of Life?* (1956), I have pointed out that the oral–*masochistic* (not sadistic, hate–filled) basis of Lesbianism works on a five–layer structure:

1. Stabilization on the oral–masochistic, hence pre–Oedipal, level;
2. First superego veto, objecting to the "pleasure–in–displeasure" pattern;
3. First defense of pseudo–aggression;
4. Second superego veto, objecting to this "hatred";
5. Second defense of pseudo–love, with Oedipal camouflage.

(It should be understood that this last defense, which reaches the surface as the husband–wife relationship, does not represent a reenactment of the roles of good mother and beloved child, as alleged, but an unconscious—and wholly concealed—dramatization of the fantasy of the masochistically mistreated child and cruel, denying mother.)

The five–layer basis of Lesbianism explains a number of phenomenologically observable facts.

First, the typical high tension of the Lesbian relationship as well as the pathological jealousy. This jealousy, in inner reality, merely provides a point of departure for masochistic injustice-collecting.

Second, the abundance of ever–ready hatred in Lesbian relationships, which becomes evident at the least excuse and often is expressed in physical attacks. The pseudo–love which is the final defense of the Lesbian is easily penetrated to reveal the pseudo–aggression beneath.

Third, the husband–wife drama enacted as Oedipal camouflage is merely an admission of the lesser intrapsychic crime, devised as a screen for the more guilt–laden masochistic mother–child relationship, which dates back to pre-Oedipal conflicts.

Fourth, the inevitable failure of a relationship established within the framework of Lesbianism. A person unconsciously seeking constant psychic masochistic satisfaction is incapable of conscious happiness.

Fifth, the central point of the homosexual's "solution" consists of a specific elaboration of psychic masochistic vicissitudes stemming from the first months of life. It is necessary to distinguish between the genetic and clinical pictures in psychic masochism. The genetic picture, worked out by Freud though little utilized by him, begins with infantile aggression. This aggression recoils because of guilt, and the guilt is secondarily libidinized.

The clinical picture, comprising the phenomena actually observable in the adult neurotic, begins here. It appears in response to the veto pronounced by the inner conscience (superego). The superego objects to

any pleasure, including, of course, the pleasure of psychic masochism. The clinical picture, worked out more than two decades ago by myself, is connected with the earliest (oral) level of regression. Its pattern is that of the "mechanism of orality": construction of external defeats; simulated struggles against these defeats; masochistic whimpering, and self–pity.

Consciously, neurotics controlled by the mechanism of orality are aware only of the "righteous indignation" with which they attempt to fight against their self–constructed defeats, and which leads to self–pity. They remain consciously oblivious to their initial provocation, and to the masochistic pleasure derived from contemplating their humiliation or failure. Since both these vital points remain completely repressed, the illusion of "aggression" can be successfully maintained. The dynamically decisive masochistic substructure does not become conscious.

The outcome is injustice–collecting, practiced without let–up. The individual's conscious desire for success is invariably canceled by his unconscious desire for refusal, rejection, or denial. The unconscious aim is the more powerful; it molds the neurotic into an unconscious glutton for punishment.

The effectiveness of "The Fox" derives from Lawrence's predominantly correct–and obviously intuitive—observations of a series of clinically verifiable facts on Lesbianism.

MACDONALD, JOHN M. *Psychiatry and the Criminal.* Charles C. Thomas, Springfield, 1957. 227 pp. $5.50

This is a valuable book for workers in the field of criminal psychiatry. It holds no great interest for the general psychiatrist who does not work in this special area.

Dr. MacDonald writes lucidly and well. He has covered the pertinent literature quite thoroughly and has obviously read widely. To each chapter there is appended an adequate bibliography. In his position as Assistant Medical Director of the Colorado Psychopathic Hospital, and chief of the criminal service, he has had an extensive experience. One wishes that he had drawn more heavily upon it.

The book opens with an excellent chapter on the Origins of Criminal Behavior. Dr. MacDonald has covered a wide variety of topics within this small volume; he has included, for example, a comprehensive discussion of the chemical tests of alcoholic intoxication. He rides no hobbies and does not go off on tangents; his views are sound. He reports that he recently made a survey of the penetration of psychology and psychiatry into present day law school curricula. In the more than one hundred approved schools surveyed, only twenty–four gave any instruction in these subjects, and only five had organized courses. Many of the law school deans felt that there was no need for such instruction. A similar survey of the instruction in legal principles and procedures in medical schools would be of interest.

The reviewer feels that too much notice is given to how the expert should defend himself against legal trickery. A more serious criticism is that the author is too parochial in his stringent advice against letting hearsay material enter the psychiatrist's report. The courts of Colorado are notorious for their extreme position in this matter. Fortunately, there are many jurisdictions that are far more liberal. The author cautions that "the physician who expresses an opinion prior to trial should be careful to form his opinion solely upon the examination of the defendant. He cannot, therefore, base such opinion either in whole or in part, upon information obtained from police, relatives, social workers, psychologists or other persons". Happily such advice need not be followed, under the more liberal and enlightened procedural rules under which this reviewer works. Dr. MacDonald appears to be under the impression that confidences given to a physician making an examination on behalf of the Court may be privileged and that the physician may assert this privilege. Neither point of view is generally held by the law. His list of states having sexual psychopath laws is too large; certainly the Maryland Code has no such statutes.

But, all in all, this book is a contribution to psychiatric literature. This reviewer is glad to see Charles Thomas publish a reliable book of this character in the field of criminal psychiatry in contrast to their publication of De Rivers' prurient and fallacious volume on the sexual psychopath.

Manfred Guttmacher

WALSH, F. M. R., Editor. *Selected Papers of Sir Gordon Holmes.* Macmillan & Co., Ltd., London, 1956. 204 pp. $3.75.

This paper–bound volume was published as a tribute to Sir Gordon Holmes on the occasion of his eightieth birthday. Eleven papers are included. Four and part of another are concerned with studies of the cerebellum published in 1904, 1907, 1908, and 1922. The second section of the volume is concerned with cortical representation of vision and includes four papers published in 1916, 1918, 1931, and 1934. The last section deals with visual orientation and attention and includes two papers published in 1918 and 1919. Finally, there is a complete bibliog-

raphy of the published works of Sir Gordon Holmes extending over a period of fifty–five years from 1901 to 1956 and including 121 articles and 5 books, covering the entire field of clinical neurology.

This publication will be of interest to all who are interested in the nervous system. It is of particular interest to the younger neurologists who are perhaps unfamiliar with the origin of some facts and concepts which they use in the practice of their specialty. It is a most fitting tribute to a great clinician and investigator and will inspire and instruct all who read it.

Charles Van Buskirk

OSGOOD, CHARLES E., SUCI, GEORGE J. AND TANNENBAUM, PERCY H. *The Measurement of Meaning*. Univ. Illinois Press, Urbana, 1957. 342 pp. $7.50

Dr. Osgood, who is research professor of psychology and director of the Institute of Communications Research at the University of Illinois, and a leading figure among American psychologists, and his colleagues Drs. Suci and Tannenbaum, have been working for over six years to devise an objective measure of meaning. They have now presented us with an operational tool which, among other things, should soon exert an important effect upon research which attempts to bridge the gap between psychiatry and systematic behavior theory. The book is thus worthy of careful attention.

The central convictions which mark the work of these authors are that if "meaning" is to be studied scientifically, it must be given operational tangibility; it must be assigned certain *general* rather than unique individual characteristics (so that intra–, as well as inter–individual comparison is meaningfully possible); and it must be assumed multi– rather than uni–dimensional in character.

Cognizant of these requirements, the authors first postulate a semantic space, Euclidian in nature, and of initially unknown dimensionality. Each of a series of semantic scales, the limits of which are defined by a pair of bipolar adjectives (*e.g.*, *good—bad*; *strong—weak*; *fast—slow*) is assumed to represent some rectilinear function which passes through the origin of the semantic space. The position and structure of a concept (*e.g.*, *me*, *God*, *baby*, *Eisenhower*, etc.) in this semantic space—that is, the meaning of the concept—are given by *S*'s selection of metric scores along a series of such seven–point scales. The establishment of some small number of orthogonal dimensions then makes it theoretically legitimate to speak of the direction of a concept from the semantic space origin (*i.e.*, quality of meaning), and of the distance of the concept from this origin (*i.e.*, intensity of meaning).

Drs. Osgood, Suci and Tannenbaum then present (by preference rather than necessity) a rapprochement between mediation learning theory, and their operational conceptualization of meaning. According to mediation learning theory, their argument runs, a mediating reaction, r_m, elicited by a concept, will evoke one or more of a group of overt responses, depending upon the exact stimulus context (that is, according to response relevance, opportunity for response, and so forth). It is an operational assumption that some of the overt responses elicited by this r_m will consist of *S*'s checking a series of adjectival bipolar scales, such that the intensity of the characteristic indicated by *S* on some given scale approximately matches the strength of this characteristic in the r_m elicited by the concept. If each of a series of concepts (for example, *Churchill*, *mother*, *baseball*, *me*, etc.) be rated by a group of *S*s along each of, say, 20 such bipolar scales, it is then possible literally to construct a three–dimensional model of the concepts in semantic relationship to each other. Factor analyses of entire sets of data of this sort have repeatedly yielded three main factors appearing in the diverse studies reported, nearly always in the same order. These factors are called evaluation, potency, and

activity, of which the evaluative factor accounts regularly for twice as much variance as the other two, and potency and activity for twice as much variance as any other factor extracted. After thus describing in detail the logic of semantic measurement and the dimensionality of the semantic space, the authors then present a worthy account of how the semantic differential is, in general, actually constructed, applied, and tested, and of what considerations and precautions must be born in mind for its application.

Many empirical and theoretical applications of the semantic differential are reported in the second half of the book. Among those are: dream symbolism; the Thigpen and Cleckley case of triple personality; the TAT; the ethnocentric, the schizophrenic, and the anxious personality; identification, and numerous aspects of experimental aesthetics and psycholinguistics. Some remarks concerning the cogent implications of these generalizations, which will be of considerable interest to the medical and psychiatric audience, are in order. The particular approach to meaning employed leads, as the authors point out, to a definition of "mental illness as involving a disordering of meanings or ways of perceiving significant persons or situations, and psychotherapy as involving a re-ordering and alteration of these meanings in the direction of consistency with those of other people considered normal" (p. 217). Such a definition of mental illness may well be taken as insufficient by many readers, but it should be noted that at least this definition is not at variance with any other. Moreover, it has two assets which justify it: it is at least a *necessary* implication of mental illness; and it *is* rigorously anchored to specifiable operations by which it is assayable—which is far more than can be said for sundry other definitions.

Again, according to the authors' analysis of the identification process, via a fusion of learning theory and semantic measurement theory, imitation emerges as the referent for similarities of overt behaviors between the model and the S; while, on the other hand, "*identification refers to similarities of meanings*" (p. 252). Whatever may be the reaction to this definitive distinction in other circles of concern with the etiology of mental illness, here is at least a clear-cut definition of something of basic importance which can be, and it is hoped will be, explored in the future.

Consider next their application of the semantic differential to word combinations (the encoding of verbal messages). It is most interesting, stimulating, and hopeful to find some empirical demonstration of phenomena which, in principle, are clinically well known. A combination of two words can easily and objectively be shown to result in changed meaning (as heretofore defined) which is *some* compromise, and yet not a simple arithmetic compromise between the individual meanings of the two words. This sort of thing is indeed the stuff and substance of which the anxious patient's talk is frequently made. Baffling, hedging, and inconsistent word combinations can sometimes be understood clinically; with the semantic differential, they may be explored objectively. As the authors state "the semantic effects of word combinations are neither haphazard nor unique" (p. 283).

Such implications as these lead one to a fresh orientation toward certain aspects of free association. For example, recall, as the authors state, that the representational mediating reaction, r_m, is always a necessary condition for the emergence of meaning; but that it is not a sufficient condition to *define* meaning. It follows that "Agreement on the referents of signs implies nothing whatsoever about the similarity of the representational states associated with these signs" (p. 323). A further implication (not labeled, but implicit) is that an objectively clear disparity between the referents of two signs does not at all imply a *necessary* dissimilarity between the representational states (the r_m's) associated with these signs. Indeed, it should be

noted in regard to this implication that the very idea of psychic determinism, as postulated by Freud himself, essentially demands, among other things, some such notion of meaning. For how else is one to explain the particular and the incongruous choice of words by the patient, or the sudden referential shift during the process of free association? When thought processes cut across the bounds of space and time, one of the links which connect adjacent components of these thought processes must often be (though it admittedly does not necessarily *have* to be) a common r_m.

The book stands as a masterpiece of rigor and intellectual honesty; it conveys a willingness to be found wrong, and to treat inconsistent results in a most constructive fashion. As with any book, there are places in which the delivery is not quite as clear as it could be, but by and large it is a well-organized and well-written book. Furthermore, it is liberally scattered throughout with fertile hypotheses, some of which are explicitly stated, others of which may readily and frequently occur to the reader as he proceeds.

Some of the experiments reported in the later sections of the book may seem at first sight to show minor loopholes, but this may as likely be the necessary evil from having to compress several years of coordinated work into a few pages. In any event, this does not detract from the value and status of the book as a whole. As the authors themselves are perfectly well aware, many sophisticated readers will take issue with the conceptualization and definition of meaning lying at the core of the entire work, and hence with the very title of the book. Let them not prejudge too hastily however, nor too strongly. For it is both fair and essential to understand the historical and contemporary contexts in which the work of Drs. Osgood, Suci and Tannenbaum developed. The role of internal mediating responses is playing an increasingly important and central role in theoretical psychology and it is quite fitting that the whole construct of meaning should be at least partially identified with implicit behavioral processes, and thus thoroughly anchored to specifiable stimulus and response events.

One critical comment which in fairness has to be made is that when the book is almost read, and our energy spent, we come across the statement "we believe that *habits of usage and association* serve to refine the relatively gross differentiations of which the representational system is capable" (p. 324). The point here is not simply the bald fact that the semantic differential is yet incomplete (either in terms of the number of factors isolated, or otherwise)—this sort of thing is understandable and perhaps inevitable in a progress report. Rather, difficulties arise because of an unfortunate (though largely apparent) entrenchment behind the terms *habit* and *association*, as the missing determinants of the encoded response, with but one page of elaboration as to what this qualification implies. 'Association' has the edge on 'habit' in terms of age, but the two are probably of equal rank in terms of the trouble they have made for psychology. Nor are the authors unreasonable in invoking these two concepts to complete the picture regarding the determinants of meaning. The reviewer's complaint is essentially that the authors have not elaborated for the reader (as they most surely could have done) upon some problems that these two constructs raise, the solutions to problems that they may provide, and upon some of the limits of their meaningful application.

From another point of view the essential incompleteness of the semantic differential in its present (or even some future) form is as much a virtue as it is a vice. It does involve a working definition of meaning which does not depend upon the exact nature of the referent to which a given sign is associated, thus facilitating inter– *and* intra–individual comparisons without there being

any necessary similarity between the referents to which different signs refer.

The book is immediately underscored by the authors as a progress report, and hence by definition their approach to semantic measurement is not yet complete; indeed, it has only just begun. But in terms of what data have been collected the presentation is integrated and meaningful in its own right. Toward the end of the book the authors express their own primary concern with methodology, refinement, and reliability, which is as it should be. While they clearly encourage application of their work, they express also a sober fear that Tom, Dick, and Harry will run off to apply their new tool indiscriminately to newer and yet more complex areas of behavior, forgetting about the more basic problems of checking, refining, and generalizing the model so far established.

At bottom, the growth of any science may be said to rest upon the development of new tools. Drs. Osgood, Suci and Tannenbaum have presented one new tool, which for much new work, will be essential.

Edmund S. Howe

HEWITT, DONALD W. *Alcoholism*. Lea & Febiger, Washington, 1957. 112 pp. $3.00

When one stops to consider the enormous amount of literary material concerned with alcoholism that has accumulated in recent years, it seems apparent that any new publication should have some definite advance to contribute or should at least provide a review of most of the better known facts about the subject. Dr. Hewitt's book it seems to this reviewer does not fully satisfy either criterion; for while gaining in lucidity from a chatty anecdotal style of writing, the approach adopted to the admittedly vast problem of alcoholism is unscientific, and the volume offers little that is fresh or interesting in its treatment of its thesis. The best that can be said of it is that the author appears eager to transmit his sympathy and optimism for the alcoholic to a larger medical public; but the lack of information in various chapters of the book is disconcerting. Even the definition given of alcoholism is open to doubt. Surely the author is defining alcoholic addiction on page 7 and not (chronic) alcoholism which most agree to be "the physical and psychological changes following the excessive and prolonged use of alcoholic beverages" (Gibbins).

As one proceeds through the work one feels that the accounts furnished of the various psychiatric syndromes that may complicate alcoholism are scanty and ill-formulated; nor do the medical complications fare much better "neurologically speaking, alcoholic polyneuritis is characterized by its multiple neuritis aspect and, in alcoholic cases, it is sometimes found in combination with Korsakoff's psychosis" (p. 52). Little reference is made to the often severe hazard of pneumonia in malnourished alcoholics which makes antibiotic coverage of delirium tremens not infrequently necessary; no reference is made to modified insulin therapy, a safe efficacious well tried treatment for alcoholic patients. The not uncommon danger of "drinking past the Antabuse" in patients put on this drug is not mentioned. Psychotherapeutically too, Dr. Hewitt's book appears to this reviewer to lack in that some of the statements contained within it are over simplifications of the therapeutic problem "by merely exercising good, everyday common sense, the physician can often bring the alcoholic's hidden fears, emotional conflicts and guilt complexes out into the open where they seldom long withstand a logical and rational scrutiny" (p. 63). Moreover the book is defective in other areas such as the etiology of alcoholism generally, the vocational guidance of alcoholics, methods of group therapy and so on.

It has long been known that alcoholism is not infrequently a symptom of a psychiatric disorder—such as a recurrent affective state—and it seems to this reviewer that the best advice that can be given to the practitioner who finds himself in difficulties with an alcoholic patient, is to refer him for com-

prehensive psychiatric evaluation. This is not recognized or effectively communicated by Dr. Hewitt's book; he does not appear to be aware of the danger of transmitting to the practitioner too superficial an approach to the patient's alcoholic problem. This is the most cogent criticism to be made of a work that is otherwise compact, readable and well intentioned.

A. Hordern